Bison Management Plan

Wind Cave National Park

December 2006

BISON MANAGEMENT PLAN

AND

ENVIRONMENTAL DOCUMENTATION

WIND CAVE NATIONAL PARK

2006

Recommended:

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Biologist Date
Wind Cave National Park

Concurred:

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Chief of Resource Management Date
Wind Cave National Park

Approved:

_____ _____

Superintendent Date
Wind Cave National Park

I. Purpose and Need

A. Introduction

Wind Cave National Park (WICA) contains mixed-grass prairie, ponderosa pine, and riparian ecosystems, and lies in a transition zone between eastern and western biomes. The diversity of habitat supports a wide variety of plants and animals, including those that have been successfully restored after extirpation, such as bison and elk.

Bison were a keystone element of the Great Plains for nearly 10,000 years, providing sustenance and materials for many on North America's original human residents, and staple food for early explorers, fur traders, and early European settlers.

Bison are a part of the modern day Euro-American culture. The American bison (*Bison bison*) is an icon used commonly as a symbol on currency, stamps, school and team logo, government departments, and even businesses.

Bison are also closely associated with the Park and the National Park Service since it was one of the reasons why land for this Park was set aside. The Wind Cave Game Preserve was established in 1912 for a ". . . permanent national range for a herd of buffalo . . ." (National Game Preserve Act).

Bison are a wildlife species that visitors can readily view within the park and provide an educational opportunity about nature that few other species can rival.

The park bison herd has high levels of genetic variation compared with other federal populations as studies have revealed the park bison have high genetic variation and heterozygosity, when compared to other federal bison populations examined (Halbert 2003).

From cultural, historical, biologic, and legislative viewpoints, it is imperative that the bison within the Park are managed in a respectful and considerate manner while adhering to National Park Service and Park policies. Additional information on the significance of bison as a resource is found in Appendix A.

Currently, the park has a General Management Plan (GMP) completed in 1994 (NPS 1994a) and Resource Management Plan (RMP), also completed in 1994 (NPS 1994b) that act as broad guides for managing resources within the park.

B. Purpose and Need for the Plan

1. Purpose of the Plan

Wind Cave National Park consists of 28,295 acres of mixed grass prairie and Ponderosa pine forest. With the Park surrounded by a woven wire fence, there is a finite amount of forage available to a wide variety of herbivores such as black-tailed prairie dog, mule deer, pronghorn antelope, elk and bison. The Bison Management Plan consolidates and summarizes past, present and future bison management at WICA. The plan defines the desired future conditions for the bison herd at WICA, outlines the number of bison that the Park would maintain, and alternatives to manage the bison population. In addition, the plan outlines methods to establish conservation herds to maintain the valuable bison genetics

found at WICA. The park must also be prepared for the possibility of no interested parties for surplus bison from WICA and the plan outlines measures to deal with this situation.

Bison are not intensively managed at WICA, although a roundup is conducted in October and sufficient numbers are removed to keep the herd close to desired population levels. This plan will complement other Park plans that are in various stages of development, such as vegetation management plan, prairie dog management plan and elk management plan.

2. Need for the Plan

A management plan with associated environmental documentation has never been completed for bison management at Wind Cave National Park. This plan is not new to the park, but represents a formalization of bison management activities that have taken place over the years within the park.

The objectives for managing bison at WICA must take into consideration available forage in the mixed-grass prairie, other wildlife species, genetics, disease, and ethnographic/cultural concerns. As such, the following desired future conditions and objectives have been developed:

- Herd population would be maintained with other wildlife so approximately 25% of total forage is utilized, while allowing natural variability in population size.
- Establish a monitoring program to address the concern of maintaining the desired numbers while ensuring effective range utilization..
- Maintain or increase the genetic integrity and diversity of the bison herd. (Bison numbers should remain above the minimum number of 400 to avoid problems with genetic diversity. Also, the Park must make sure that other bison are not added to the herd so that the genetic significance is maintained).
- Manage the herd for health conditions resembling free ranging bison and free of non-native diseases such as Foot and Mouth Disease (FMD), Brucellosis, Tuberculosis (TB), etc., to avoid any need for de-population or the parks' ability to live ship animals.
- Bison are managed as an important ethnographic and cultural resource.
- To the extent possible, allow bison to decompose on the prairie

C. Purpose and Significance of the Park

1. Description of the Park

Location. The park is located near the southern border of Custer County, about 10 miles north of Hot Springs and is bounded by Custer State Park on the north, Black Hills National Forest to the west, and private lands on the east and south (Figure 1). U.S. Highway 385 and South Dakota Highway 87 are the major roads through the park, with NPS 5 and NPS 6 as secondary access roads (Figure 2). The park is in the rough shape of an inverted "U" with the eastern leg shortened. The highest point within the park boundaries is Rankin Ridge at an elevation of 5,013 feet. The lowest point in the park is approximately 3,560 feet above mean sea level at the southeast corner, in section 35 T5S R6E, near the mouth of Fuson Canyon.

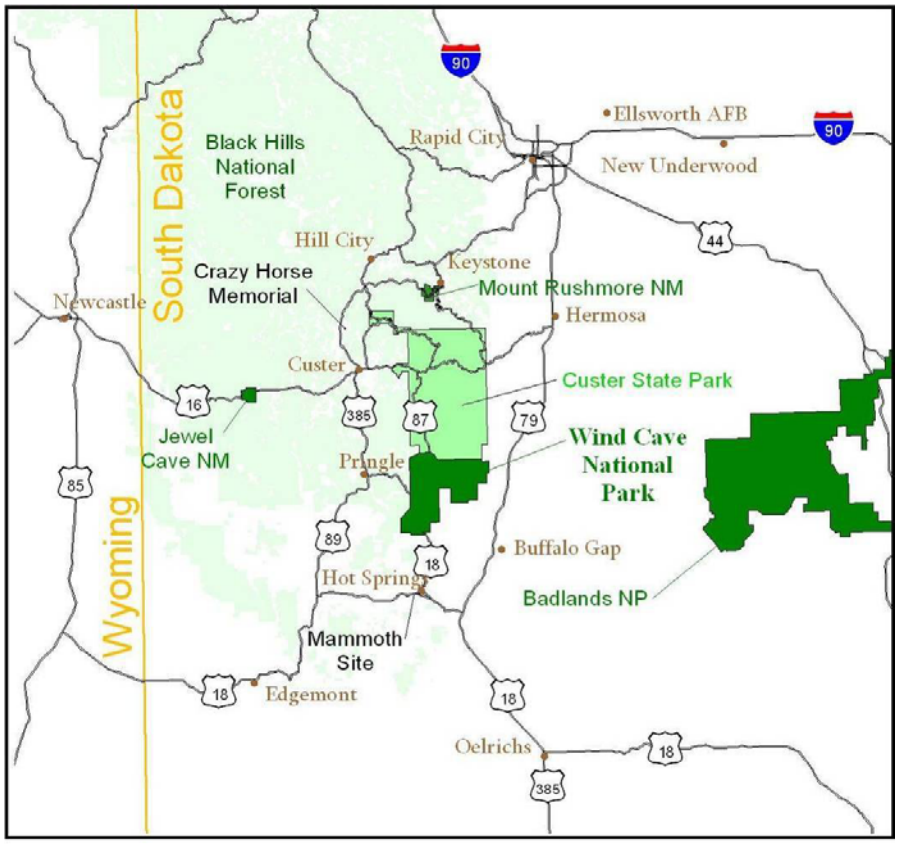

Figure 1. Location of Wind Cave National Park in southwest South Dakota

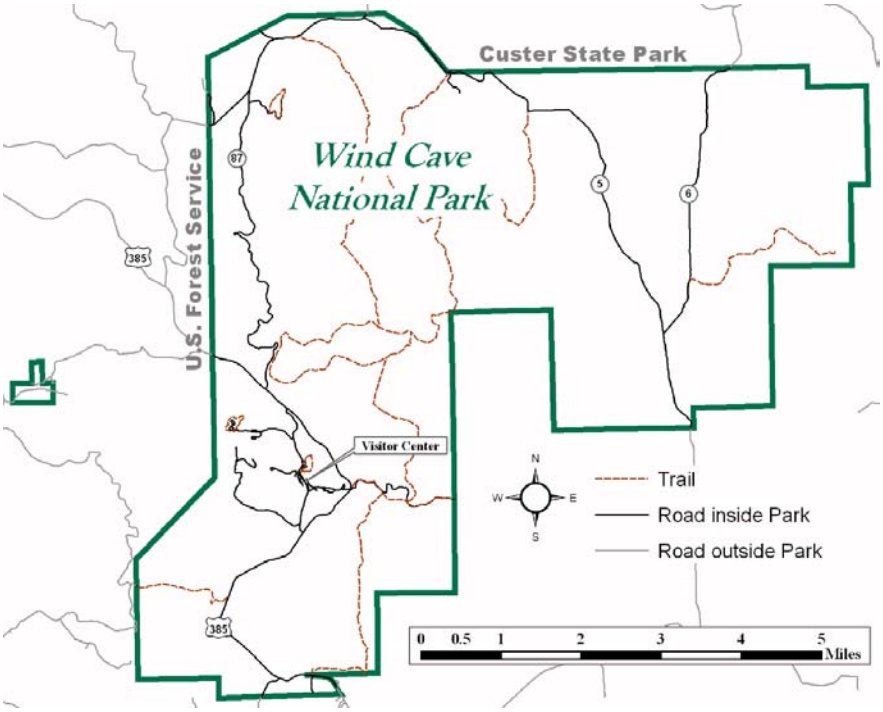

Figure 2. Wind Cave National Park boundary

Soils. There are four geology and soil areas within WICA. From West to East, these are the Central Crystalline, the Limestone Plateau, the Red Valley, and the Dakota Hogback areas.

The Central Crystalline area consists of schist and granite with very pronounced ridges and peaks with steep wooded slopes and gently sloping meadows. The Limestone Plateau is characterized by gently rolling to steep hills. It consists of limestone and calcareous sandstone with ancient high terraces of sedimentary, igneous and metamorphic rock. The Red Valley consists of sloping and gently rolling areas with prominent ridges and peaks. It consists of reddish siltstone and sandstone. The Dakota Hogback is strongly sloping and steep valley sides and ridges derived from inter-bedded sandstone, calcareous mudstone, and limestone.

The major soil associations found within the park were formed from underlying parent material or deposited through erosion. These soils relate to specific geologic landforms and develop the park topography and relief. They also play major roles in the climate and development of the natural vegetation found within the park (Ensz 1990). There are numerous mineral licks that are utilized by bison and other wildlife species throughout the Park.

Vegetation. The park area is dominated by prairie, as it is a part of the midgrass belt of "medium-statured grasses that runs from Saskatchewan to Texas" (NPS 1979). The prairie vegetation within the park consists primarily of blue grama (*Bouteloua gracilis*), western wheatgrass (*Agropyron smithii*), little bluestem (*Andropogon scoparius*), and threadleaf sedge (*Carex filifolia*). Ponderosa pine (*Pinus ponderosa*) dominates the forested areas of the park with small amounts of common juniper (*Juniperus communis*), paper birch (*Betula papyrifera*), plains cottonwood (*Populus deltoides*), and American elm (*Ulmus Americana*). It has been estimated that the size of the forested area has increased by more than one third since 1870, primarily due to the suppression of fires (NPS 1979).

Water Sources and Developments. There are 3 perennial streams in the park (Figure 3). Highland Creek originates in Custer State Park to the north and flows into WICA for approximately 2.3 miles before sinking into the ground. Cold Spring Creek comes into the Park from the west and flows into Beaver Creek. Beaver Creek also flows into the park from the west and disappears into the ground roughly 3 miles downstream from the west boundary. The distance of flow for these perennial streams varies depending on precipitation.

There are approximately 100 known springs in the Park. Twelve of the springs were developed with the intent to disperse the large mammals throughout the park. There have not been any studies to quantify the use of these developed springs but anecdotally it appears that some of the developed springs are used on a regular basis.

The delicate interaction of climate, geologic substrate, geomorphology, and soils dictate the type of vegetation found within the park. **Vegetation and water are the resources that form the ecological foundation for wildlife and many of the natural processes occurring within the park.**

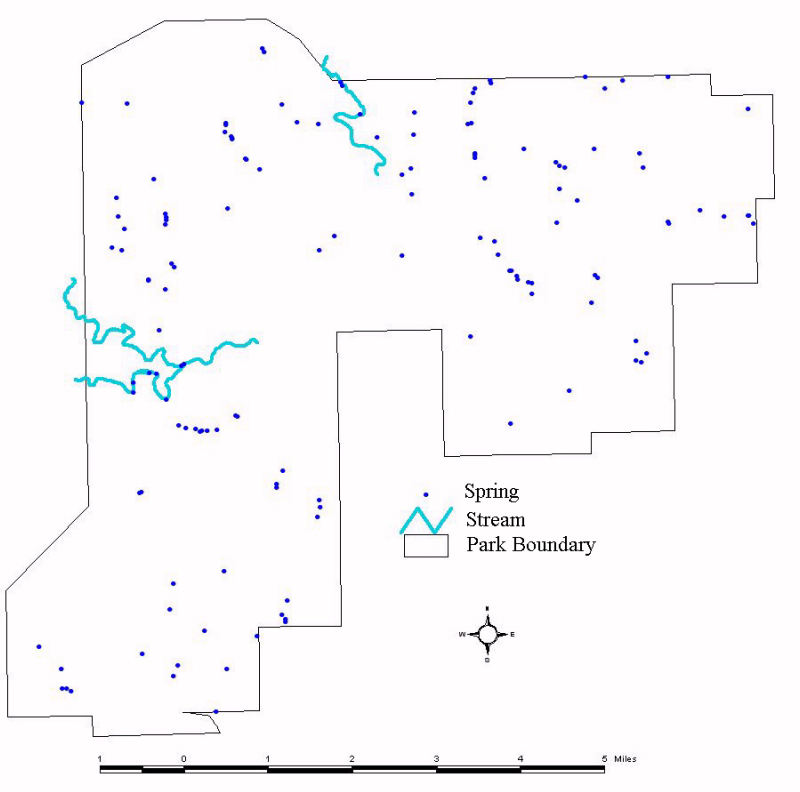

Figure 3. Park hydrologic resources.

2. Significance and Legislation

Wind Cave National Park was established with the act of January 9, 1903 (32 Stat. 765-766, 16 USC 141-146), to protect Wind Cave. Subsequent legislation, summarized below, influenced and changed the size and purpose of the park to include surface resources.

The act of August 10, 1912, provided for the establishment of Wind Cave National Game Preserve on the land included within the boundaries of Wind Cave National Park under the jurisdiction of what was then the Bureau of Biological Survey of the U.S. Department of Agriculture. This action established "a permanent national range for a herd of buffalo to be presented to the U.S. by the American Bison Society, and for such other native American game animals as may be placed therein."

The Organic Act of 1916 (16 USC 1) states that the fundamental purpose of the National Park System "is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." The 1978 Amendment to the Organic Act known as the "Redwoods Act" states

> "…the protection, management and administration of these areas shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established." The statements in these two Acts provide a clear direction for park management to allow only those activities, or level of use, that leave park resources

unimpaired. Active public education and interpretive themes dealing with these issues are needed to lessen controversies and conflicts.

The act of March 4, 1931, expanded the boundaries of Wind Cave National Park by 1,200 acres.

Section 601 of Public Law 148, dated June 15, 1935 (49 Stat. 383, USC 141b), stated that "effective July 1, 1935, the Wind Cave National Game Preserve in the State of South Dakota" was to be abolished, all property transferred to and be made part of Wind Cave National Park, which would be subject to all applicable laws and regulations for the purposes expressed in the act of August 10, 1912, establishing the game preserve.

Public Law 708 of August 9, 1946 (60 Stat. 970, 16 USC 141a), expanded the park boundary to increase the park's acreage from 11,718.17 acres to 28,059 acres to provide enough land to maintain viable populations of big game animals, especially pronghorn antelope.

Public Law 95-625 (92 Stat. 3475), November 10, 1978, added approximately 228 acres to the southern end of the park.

Thus, the purpose of the Park has evolved from cave preservation to preservation and protection of both surface and subsurface ecosystems, allowing for scientific research, while providing for public use and enjoyment in ways that leave the resources unimpaired.

The significance of the Park is determined by its importance to our natural and/or cultural heritage. The following captures some of the park's significance.

- Wind Cave is among the world's longest, oldest, and most three-dimensionally complex cave systems.
- Wind Cave contains the world's largest known concentration of boxwork, a cave feature created when the cave formed.
- Wind Cave provides a valuable opportunity to explore and underground frontier to study, observe, and interpret cave resources and processes.
- Wind Cave provides a valuable opportunity to observe, study, and interpret the entire hydrologic cycle, especially the hidden part, that is, the water in route to the aquifer.
- Early cave discovery, tourism, and resource exploitation led to the park's establishment.
- Wind Cave provides a valuable opportunity for visitors to view a mixture of equally significant cave resources and prairie ecosystems and to appreciate the connections between surface and subsurface resources.
- The Park has a complete, relatively undisturbed mixed grass prairie ecosystem in the United States that serves as a resource baseline.
- Its location at the juncture of eastern grasslands/western forest results in a diversity of species easily accessed by visitors and researchers.
- The Park is a large area in the Black Hills managed primarily for natural processes.
- The Park is one of the earliest park areas to be designated a game preserve for the reestablishment of native American bison and at present is the home to one of the nation's most genetically significant and diverse bison herds.
- The Parks wildlife populations provide population and genetic resources for potential restocking in the event of catastrophe.
- The Park was one of the earliest national parks and the first established to protect a cave.

- Wind Cave contains National Register-listed and other culturally significant architectural features including CCC structures, the pigtail bridge, and the Beaver Creek bridge.
- The archeological discoveries in the park contribute to our knowledge of some of the earlier civilizations in the Black Hills.
- Paleontological remains found within the park provide valuable undisturbed evidence of many prehistoric species.
- The Park is an important part of the region's tourism.
- The Park is a designated Class I air quality area.
- Of the 16 exemplary sites identified by the Black Hills Community Inventory, 10 are located within the Park and identified as "biologically significant".
- The Park provides habitat for a wide variety of wildlife, representative of a mixed grass prairie ecosystem, including elk, bison, pronghorn, deer, prairie dogs, etc.
- The human resources of the Park go back at least 10,000 years. The Park preserves prehistoric and historic records of human activities. The region (the Black Hills) was and is highly significant to many Plains Indian cultures.
- Additionally, with the management of the Park by the Department of Interior and National Park Service, a significant influence has been exerted within the area, developing the present day landscapes experienced within the Park.

The Park contains 28,295 acres and, to now, has maintained the bison herd between 350-500 animals.

Maintenance of herds of large ungulates (bison and elk) is included in the enabling legislation for Wind Cave National Park. The act of August 10, 1912, provided for the establishment of Wind Cave National Game Preserve on the land included within the boundaries of WICA under the jurisdiction of what was then the Bureau of Biological Survey of the U.S. Department of Agriculture. This action established "a permanent national range for a herd of buffalo to be presented to the U.S. by the American Bison Society, and for such other native American game animals as may be placed therein."

16 USC 141C, known as the Surplus Wildlife Disposal Act, 1938, authorizes the "Secretary of the Interior…to dispose of the surplus buffalo and elk of the Wind Cave National Park herd". All monies received from the sale of any such surplus animals, or products thereof, shall be deposited in the Treasury of the United States as miscellaneous receipts. 36 CFR 10.1-10.4 prescribes the manner in which the animals are to be surplused including provision for reimbursements (recovery of round-up costs). 36 CFR Section 10.1 states that "From time to time there are surplus live elk, buffaloes and bears in Yellowstone National Park, and live buffaloes in Wind Cave National Park which the Secretary may, in his discretion, dispose of to Federal, State, county and municipal authorities for preserves, zoos, zoological gardens, and parks. When surplus live elk and buffaloes are available from these national parks, the Secretary may, in his discretion, dispose of these to individuals and private institutions."

NPS Management Policy 4.4.2 Management of Native Plants and Animals (National Park Service 2006a states:

> The Service may intervene to manage individuals or populations of native species only when such intervention will not cause unacceptable impacts to the populations of the species or to other components and processes of the ecosystems that support them. The second is that at least one of the following conditions exists:

- Management is necessary
  - because a population occurs in an unnaturally high or low concentration as a result of human influences (such as loss of seasonal habitat, the extirpation of predators, the creation of highly productive habitat through agriculture or urban landscapes) and it is not possible to mitigate the effects of the human influences;
  - to protect specific cultural resources of parks;
  - to accommodate intensive development in portions of parks appropriate for and dedicated to such development;
  - to protect rare, threatened, or endangered species;
  - to protect human health as advised by the U.S. Public Health Service (which includes the Centers for Disease Control and the NPS public health program);
  - to protect property when it is not possible to change the pattern of human activities; or
  - to maintain human safety when it is not possible to change the pattern of human activities.

Or,

- Removal of individuals or parts thereof
  - is part of an NPS research project described in an approved management plan, or is part of research being conducted by others who have been issued a scientific research and collecting permit;
  - is done to provide plants or animals for restoring native populations in parks or cooperating areas without diminishing the viability of the park populations from which the individuals are taken; or
  - meets specific park management objectives.

With a fence surrounding the Park, average winters with only 30" of snowfall, and the extirpation of large predators such as wolves, the bison population increases annually and must be controlled by some type of human intervention or reduction. Without some type of intervention, eventually there will be a shortage of forage necessary to maintain the variety of herbivores in the Park. NPS Management Policy 4.4.2.1 states that reduction techniques may include "relocation, public hunting on lands outside the Park or where legislatively authorized within a park, habitat management, predator restoration, reproductive intervention, and destruction of animals by NPS personnel or their authorized agents."

D. Bison Management at Wind Cave National Park

On January 9, 1903 Wind Cave National Park was established consisting of 10,532 acres.

In 1911, J. Alden Loring was directed by the American Bison Society to survey South Dakota "for the purpose of selecting a suitable tract of land for a National Game Reserve." (Loring 1911) Loring's report describes the land, water supply and animals that he felt the land was most suited for.

The Wind Cave Game Preserve, administered by the USDA Bureau of Biological Survey, was established on August 10, 1912 based on Loring's report. The game preserve consisted of 4,000 acres of Wind Cave park land and five or six acres from Harney National Forest lands. An additional 80 acres was acquired by buying privately owned ranches. The money

needed for fencing the area and acquiring the lands outside the park was provided by the American Bison Society.

In November 1913 a herd of fourteen bison (6 bulls and 8 cows) were brought to the game preserve. This initial group was a gift from the New York Zoological Society through the American Bison Association.

Six more bison (2 bulls and 4 cows) were brought to the game preserve from Yellowstone in June of 1916.[1] These 20 animals were the founders of the WICA bison herd.

From 1923, when the first culling of the herd took place, until 1935, approximately 395 bison had been culled. This included 266 live for breeding, restocking or exhibition, 111 for meat, and 18 died of natural causes.

In 1935 the Wind Cave Game Preserve was transferred from administration by the USDA Bureau of Biological Survey to the Department of Interior, and became part of WICA.

On June 16, 1938 An Act (52 stat. 708) that authorized the Secretary of the Interior to sell or otherwise dispose of surplus WICA buffalo and elk, was approved. This is referred to as the "Wildlife Disposal Act of 1938".

In 1945 the first testing for brucellosis took place. At that time 33 bison out of 60 tested were found to be reactors, and 18 additional animals were suspect. Therefore, 85% of the 60 tested were either reactors or suspects (NPS 2002).

In 1946 there were 50 bison calves vaccinated for brucellosis as a result of the initiation of a program to control the spread of brucellosis. Vaccination of calves and yearlings continued for the following 2 years.

In 1948**,** fences and facilities for vaccinating were removed from the Park and vaccination of bison for brucellosis was discontinued until 1965.

At various times throughout the Park's history, grazers have had adverse impacts on rangeland resources. For example, in the mid-1950s, managers removed 1,000 elk due to grazing and browsing impacts.

In 1952, under an agreement with the State of South Dakota, bison were baited into Custer State Park (CSP). This was the major means of disposing of bison until 1961 when the agreement to bait the bison into CSP was unofficially terminated (official termination in 1964). This change was due to the high incidence of brucellosis in the Wind Cave herd, and the initiation of a calf-hood vaccination program by CSP.

In 1960 brucellosis test results revealed approximately 75% of 52 bison tested were reactors.

In 1964 a brucellosis eradication program was initiated in which 220 bison were shot in the field (inside WICA). The herd was reduced from 440 to 220.

[1] Anecdotal information indicates that WICA brought in a bull from Theodore Roosevelt NP (THRO), but is not substantiated in park records. If a bull had been brought in from THRO recent genetics research indicates that this animal did not contribute to the genetics of the WICA herd.

In 1965 new Bison corrals were constructed and vaccination of female calves was resumed. Vaccination of all female calves trapped during roundups continued through 1997.

In the mid-1960s, the Park established a target bison management population of between 350-500 animals. This estimate was provided to the Park by the Soil Conservation Service, now Natural Resource Conservation Service (NRCS), using an evaluation of soils, annual precipitation, forage production and forage needs of the herbivores in the Park e.g. bison, elk, pronghorn, mule deer and black-tailed prairie dogs. Their estimates found that the Park forage base could maintain a range of 350-500 bison, 350-500 elk, 100-300 pronghorn, 50-150 mule deer and 1500-2500 acres of prairie dogs. This was a fairly conservative estimate and the Park has managed the bison population within these numbers.

During the 1979 roundup, 6.5% of 185 bison had tested positive for brucellosis. 194 bison were culled from the herd through slaughter, leaving approximately 353 bison.

On November 12, 1982, WICA was placed under quarantine for brucellosis by the South Dakota State Veterinarian. The last case of brucellosis in the Park was found in 1984. On December 5, 1986 the Park was released from quarantine. There have been no positive reactors from 1985 to the present.

In 1987 the first live shipment of bison since 1943 was conducted.

In 1994 the Park began working with the Inter-Tribal Bison Cooperative (ITBC), an organization representing approximately 50 Native American Tribes from 16 States. The ITBC assisted the NPS in screening and recommending tribes for award of surplus bison from WICA. From 1987 through 2006, 1,299 bison have been sent to Native American Tribes. Also in 1994 the Park initiated the implanting of electronic transponder chips in all captured bison, for identification purposes.

In 1996 RB51 vaccine was used to vaccinate 39 heifer calves. This vaccine hadn't been approved for usage on free roaming bison in a National Park, but was the only vaccine approved for use in the State of South Dakota. In 1997, WICA received a one year waiver from the State of South Dakota to return to using Strain 19 to vaccinate heifer calves.

In 1998 the vaccination program for bison heifers was terminated within the Park. Other than the use of RB51 in 1996, Strain 19 has been the only vaccine used to vaccinate bison in the Park.

From 1999-2001 a three-year bison genetics study was conducted. Blood and tail hair samples from 475 bison have been collected and sent to Texas A&M, 293 of which were used for mitochondrial and nuclear DNA analysis. Final results received in 2003 revealed that out of 10 federal herds tested, WICA and Yellowstone National Park bison herds were found to be free of cattle gene introgression and were identified as having the most contribution to overall genetic variation in federal populations.

In 2001 a state law was passed allowing the transfer of unvaccinated heifers within the State of South Dakota as the state was declared a "Brucellosis Free State". At that time, the WICA bison herd numbered approximately 350-400 animals.

In 2002, due to a drought and drop in bison market prices, there were no requests for bison and no roundup was conducted. Herd size was approximately 450-475 animals.

In October 2003, a roundup was conducted and the herd size was reduced to approximately 370 bison, as the park removed 135 bison.

In October 2005, a roundup was conducted and the herd size was reduced to approximately 456 bison including 126 calves, with the park removing 153 bison.

In 2005, the park also began work with the American Prairie Foundation to establish a conservation herd on Foundation lands in north central Montana to conserve the genetics of the Wind Cave bison.

In October 2006, a roundup was conducted and the herd size was reduced to approximately 400 bison including 90 calves, with the park removing 132 bison.

Additional background information on the biology of bison can be found in Appendix B.

E. Related Projects, Plans, and Policies

Several plans, reports, and documents (in addition to the 1994 GMP) serve as references for this plan and provide information and guidance for the proposed management actions. The majority of these plans and documents were prepared by or for the NPS and are available for public review at WICA. Many of these are incorporated here by reference and provide the basis for many of the proposed actions as well as information used in determining environmental impacts. The action alternatives of this plan would not be inconsistent with any ongoing or planned management activities within the park. Specific plans and policies that relate to the actions proposed in this plan are summarized below.

Natural Resources Section of the Resource Management Plan (NPS 1994b). A Resource Management Plan for the entire park was prepared in 1994 and a revision drafted in 2003. This plan addressed bison management issues in project statements. The RMP identified the need for additional planning for the Park's bison population. Applicable project statements address genetic research, population management, and management of rangeland resources for wildlife species utilizing the Park.

Fire Management Plan and Environmental Assessment (NPS 2005). In 2005 the Park implemented a new Fire Management Plan. This is a detailed program of action that provides specific guidance and procedures for using fire to restore and perpetuate natural processes in the Park. This is done by accomplishing the Park’s fire management objectives, such as defining levels of protection necessary to ensure safety and protection of facilities and resources and minimizing the undesirable environmental impacts of fire management. Prescribed fire continues to be a tool for fuel reduction and for achieving resource management goals. Fire suppression continues as in the past, with natural ignitions extinguished as soon as possible. In addition, the park would utilize fuel treatments such as thinning to aid in fire hazard reduction and resource management.

Vegetation Management Plan / Environmental Assessment. This plan is currently in preparation and would direct vegetation management actions for the park in both the developed and natural zones within the park, as well as provide guidelines for the forage available for grazers within the park.

Elk Management Plan / Environmental Impact Statement. This plan is currently in preparation and would establish the desired population size of elk using the park, determine the most appropriate methods to reduce the elk population, and how to maintain the desired

population size. This plan would also provide input regarding the effects of the variable elk population on forage availability.

Black-tailed Prairie Dog Management Plan / Environmental Assessment (NPS 2006b). This plan was completed in 2006 and established the population range of prairie dog colonies within the Park from 1,000-3,000 acres and how the population would be maintained.

National Park Service *Management Policies 2006* (NPS 2006a). *Management Policies 2006* set the framework and provides direction for all management decisions within NPS. This document establishes the NPS policies for natural and cultural resource management.

Natural Resource Management Reference Manual #77 (NPS 2004a) and NPS-28, Cultural Resource Management Guideline (NPS 1998). These service-wide guidelines establish the basic principles and objectives for natural and cultural resource management within the NPS and provide general guidance for NPS actions as well as program guidance for future action plans.

National Environmental Policy Act (NEPA). As a federal facility, the park is subject to the provisions of NEPA, which require an evaluation of impacts associated with federal actions. No new construction or major change in management direction from the GMP is proposed in this document. The Alternatives section addresses alternative vegetation management options that tier from the GMP.

The impacts, outlined and evaluated here, are generally beneficial for native species and preservation of historic resources. Any modifications to the Bison Management Plan would be reviewed through the NEPA process, and where relevant to cultural resources, reviewed in accordance with Section 106 of the National Historic Preservation Act.

Endangered Species Act (ESA). As part of the NEPA compliance process, potential impacts to endangered and other special-status species are assessed. Federal agencies are required by the Endangered Species Act (ESA) of 1973 to consult with the U.S. Fish and Wildlife Service (USFWS) to ensure that their actions do not jeopardize the continued existence of any species listed as an endangered or threatened species or its critical habitat. Because threatened and endangered species protection and habitat enhancement are in part the subject of this plan, consultation with USFWS is required. All management actions by the NPS involving federally listed species would be undertaken in consultation with the USFWS.

National Historic Preservation Act (NHPA). Federal agencies are required to take into account the effects of their actions on properties listed or eligible for listing on the National Register of Historic Places. The Park contains numerous historic buildings, cultural landscapes, and archeological resources of significance. All undertakings with the potential to affect the historic character of the Park require Section 106 compliance review (as mandated by the National Historic Preservation Act) to ensure protection of cultural resources. All management actions by the NPS involving historic buildings, cultural landscapes, and archeological resources would be undertaken to assure compliance with Section 106 of the National Historic Preservation Act. All actions and projects that involve ground disturbance and changes to the cultural landscape implemented under the plan would be assessed for conformance with the Secretary of the Interior's Standards for the Treatment of Historic Properties.

In addition, this Bison Management Plan relies heavily on comprehensive natural resource inventories and evaluation prepared by and for the NPS. These documents include:

- maps, descriptions, and evaluations of vegetation including prehistoric vegetation, existing native plant communities, and special-status species;
- maps and descriptions of soils, geology, and erosion conditions;
- inventory of wildlife and evaluation of wildlife habitat quality; and
- options for population management and methods for bison removal.

F. Scoping

Scoping is the effort to involve agencies and the public in determining the issues to be addressed in the environmental evaluation. Scoping also determines important issues; allocates assignments among the interdisciplinary team members and other participating agencies; identifies related projects and associated documents; identifies permits, surveys, or consultation required by other agencies; and provides an avenue for public review and comment.

Scoping for this project began in June of 2004 with an internal scoping meeting held at the Park in which bison management needs and issues were addressed. Subsequent meetings have been held to identify desired future conditions for the Park bison herd and identify methods to achieve these conditions. Representatives from the U. S. Forest Service, South Dakota Game, Fish, and Parks, and CSP have participated in a variety of meetings to discuss impacts and implications of wildlife and vegetation management within the Park.

The purpose, need and desired future conditions outlined in this plan were initially developed during internal scoping. The allocation of forage among the Park's primary grazing species (i.e., bison and elk) was done using a forage allocation model (discussed in detail in Appendix C).

II. Bison Management Plan

A. Population Management

In 1938 Congress authorized the park to "dispose of surplus buffalo and elk" (52 Stat. 708) and the culling operation is categorically excluded from NEPA under DO-12 Handbook, Section 3.4 E (3) "Removal of individual members of a non-threatened/endangered species or populations of pests and exotic plants that pose an imminent danger to visitors or an immediate threat to park resources."

The current bison management program is based upon the following principles (adjustments may be necessary if the annual roundup is not successful in obtaining the animals needed to stay within the parameters of this plan). The culling strategy for this plan is based on recommendations by Wendy Green and A. Rothstein from a 1984 report: Herd Status and Culling Guide: Wind Cave National Park. Since there are no predators of bison at WICA, a culling strategy was devised to emulate historic predation, but only in the yearling class. By following the strategy outlined below the park will maintain the "herd leaders", which are usually dominant individuals in the bison herd that are generally older middle-age cows. Because herd leadership and most other behavioral differences in bison cows appear to be age-related, following these culling suggestions should assure a behaviorally diverse herd.

- A stable population size balanced with the vegetative base.
- A relatively old age herd structure that is representative of all age classes.
- A uniform herd structure with an even sex ratio.
- A culling strategy based on balancing the sexes in the yearling age class.
- Yearlings are generally the age class culled for shipping (this may be adjusted following years with no roundup or if there are requests for calves or older animals). These exceptions would be completed if it was determined that there would not be impacts to the herd structure or viability).
- Bison are ear tagged and implanted with electronic transponder chips.
- Calves are documented during the roundup and herd balancing occurs at the next roundup, when they are yearlings.
- Animals placed in the holding pens are the same age thereby minimizing the chance of injury to each other.
- Using the above principles bison are culled in a randomized fashion and not according to unique or unusual physical characteristics.
- Once bison make it through a roundup as a yearling they are left to live the rest of their natural life inside the Park. Bison are not removed because they are not participating in the rut or producing calves or past a certain age. It was the practice of the wildlife ranger in the late 1930's and early 1940's to selectively thin out the bison herd by killing old or sickly bison, rather than letting them die naturally (Mogen 1977).

The Park realizes the bison herd must be managed to control the population within the limits of water, land, and forage resources of this 28,295 acre park. The Park normally completes an annual roundup in October, but reserves the right to conduct a roundup at other times of the year or defer a roundup to another year. The intent of this management action is to remove yearling bison and to minimize the amount of handling, manipulation, or managing of the bison. By waiting until the bison are yearlings the Park avoids forced weaning of calves from their mothers. Naturally weaned yearlings benefited from the mother/calf

association by incurring less aggression from other herd members, and by spending more time in the center of the group rather than the periphery, where individuals are more at risk (Brookshier 2000). Bison older than the yearling age class are more difficult to handle and less dependable as far as being able to bring them into the park processing facility, however the park has successfully culled older animals and may do so in the future, if circumstances dictate. The overall weight of bison continues to increase every year through the 9.5 year age class. The average weights begin to decrease between the 9.5 and 10.5 year age classes (NPS 2004b). See Appendix D for a graph of bison weights compared to age classes. Older animals are also generally more difficult to transport and are at a greater risk of injury during processing and transport.

For the bison remaining in the park, the park does not brand, vaccinate, perform pregnancy checks or semen testing, force wean calves, supplemental feed, hunt, or perform old age culling (e.g. remove animals that reach 10+ years which many believe most bison are past their prime and probably not participating in the rut). These activities are avoided, in an effort to minimize stress and handling of the bison, and to manage the bison in as natural situation as possible. The Park does not have any interior pasture fences that would restrict the range of the bison, with the exception of a fence surrounding the housing and campground areas of the park (for human safety) and several small exclosures to protect hardwood trees and shrubs from browsing by elk.

1. Bison Population

Bison are an essential component of the Park because they contribute to the biological, ecological, cultural, and aesthetic purpose of the Park. The Park has maintained the bison population between 350-500 animals. This target was provided to the Park in the 1960's by the Soil Conservation Service, who evaluated the soils, annual precipitation, forage production and forage needs of the herbivores in the Park (e.g. bison, elk, pronghorn, mule deer and black-tailed prairie dogs). Their estimates found that the Park forage base could maintain a range of 350-500 bison and 350-500 elk. Although this was a fairly conservative estimate the Park has tried to manage within these numbers.

In 2004 park staff again established transects within the park, using NRCS methodology, to validate the bison and elk population recommendations from the 1960s and to assist in determining appropriate levels for other species, such as black-tailed prairie dog acreages. In addition, recent studies have confirmed the Wind Cave bison are free from cattle gene and as a result, management for their protection and survival is paramount. A population minimum of 400 bison is recommended to maintain the valuable genome of the herd. With this in mind, a forage-based management strategy for the park was established and provides a basis for estimating the number of bison and elk, as well as prairie dog acres the park should maintain without degradation to the mixed-grass prairie and other resources. This management strategy evaluates both condition and production of the park mixed-grass prairie. This strategy utilizes a weighted moving-mean for growth year precipitation to estimate production from year to year. Forage resources are then allocated as follows: 25% for large mammal (bison and elk) forage; 25% for other wildlife habitat and to compensate for damage to plants (e.g., trampling, hail, etc.); 50% retained to ensure plant health and vigor. The park bison, prairie dog and elk populations will be managed according to carrying capacity derived through continued monitoring.

The number of bison fluctuate within a year, for example, between calving (April/May) season and the fall roundup (October) the numbers will be on the high range, while after the roundup the numbers will be lowered until the following calving season.

At various times throughout the Park's history, grazers have had adverse impacts on rangeland resources. For example, in the mid-1950s, managers removed 1,000 elk due to grazing and browsing impacts. At present, data suggests there are areas being grazed heavier than other years, probably due in part to the higher number of elk grazing in the Park, an increase in prairie dogs in the Park, as well as several years of below average growing season precipitation (October thru the following September).

The number of elk utilizing the park is a major concern from a forage, herd health and disease standpoint. An aerial survey in the spring of 2004 found 700 (+/- 25) elk in the Park. Ground estimates in the spring of 2005 placed the number of elk in the park at about 850. Another aerial survey in the spring of 2006 found only 525 (+/- 25) in the park. Of the elk using the park, it is estimated that 40-60% are year round residents. The elk that move into the Park in the fall/winter add an extra forage need/consumption to the year round herd. If the Park is not able to maintain elk within an acceptable population range, impacts will occur to range resources. Chronic Wasting Disease (CWD) has been documented in elk and deer utilizing the Park. CWD has precluded the Park from trapping and live shipment of elk as was done through December 1994. Elk are the principle grazers that may have future impacts on the management of bison in the Park.

2. Bison Handling Facility

In 1965, a wildlife handling facility was constructed in the north-central area of the Park. The "bison corrals" include runways, crowding pens and tubs, processing chutes, holding pens and a loading facility (figure 4). This facility was originally constructed for the purpose of rounding up and removing bison, but has also been used for rounding up and removing elk. Leading into the facility is a series of wing fences and holding pastures. There is also a calf processing facility, equipment building and "Crows Nest" (protected observation platform for viewing the bison processing activity) on site. In recent years the facility has been undergoing an upgrade from wood to steel posts and steel guardrails. Two new holding pens were added in 2003. Annual bison roundups are usually conducted in October. The roundups are not open to the general public for human safety reasons and to reduce the stress on bison. The roundups are completed by Park staff with assistance from Animal and Plant Health Inspection Service (APHIS) veterinarians, contract helicopters and pilots, and occasionally staff from other National Parks.

Figure 4. Wing fences leading into corrals and corral processing facility.

3. Bison Roundup and Processing

Bison are usually rounded up in October. A number of methods for moving bison to central locations have been used within the park. In the 1930's bison were rounded up by park personnel in automobiles. Trapping bison using other means such as darting, horses, off-road vehicles, opportunistic captures or baiting into the corrals could also be used, at the discretion of the superintendent. However, beginning in the mid-1990s, the park adopted the use of helicopters to herd bison into the corrals. This was done because of the speed at which bison could be rounded up and moved to the corrals, the safety of personnel participating in the operation, and the impact to the park environment were less than the other alternatives. This operation is normally completed with the use of 2 helicopters. Helicopters and pilots are contracted for this wildlife herding operation, with the helicopters flown in tandem to move bison into the corral system. Pilots and helicopters must be certified through the federal government's Aviation Management Directorate (AMD) for Aerial Capture, Eradication and Tagging of Animals (ACETA) type of work.

Once the bison are captured inside the corrals the calves are separated from the adults. Older, large bulls are released without being processed, because of the danger to personnel, other bison, and the bulls themselves. The calves are processed in one area of the facility while the yearlings and adults are processed in another.

Bison are weighed, ear tagged, and implanted with a microchip behind the right ear. The ear tag and microchip contain a unique identifying number. Microchip ear implants will be placed on all bison brought to the capture facility. Microchips will be implanted with a special syringe just beneath the skin behind the right ear. The passive microchip is only a few millimeters in length and is embedded with a unique number. A special reader can sense the presence of the microchip and read its number when it is held within 6-12 inches of the area where the microchip is implanted. The microchip has no battery and is activated by the scanner. Lifespan of the microchip is 15+ years. In subsequent years, each time this animal is brought in for processing it will be scanned. When the implant is found the unique number is electronically located in a computerized database, where the history of that animal resides.

Additional notes are taken on anything out of the ordinary e.g. pinkeye, gorings, blood, diarrhea, body condition, overall health, etc. The bison management software, specifically designed by Park staff, was implemented in 1994 for the WICA bison management program. Once the animals are processed they are let out to an enclosed holding pasture to allow cow/calf pairs to re-unite and eliminate recapture during the roundup.

Blood is drawn from the neck or caudal vein at the base of the tail and shipped overnight to a lab in Pierre, South Dakota to be tested for brucellosis. Results of the test are usually received the next morning by the veterinarian on site. A negative brucellosis test is required before moving bison to many states. Bison testing positive will be euthanized and tissue submitted for further analysis to verify test results.

The Park is no longer required by the state of South Dakota Animal Industry Board to vaccinate un-bred female bison (heifers). Additional testing is sometimes required but the tests are dictated by the state to which the bison will be shipped. Some states require bison to be tested for other diseases such as tuberculosis and/or trichomoniasis before they can be transported into their state. The Park has been able to work with this issue by having the state veterinarian verify that bulls going out are virgin. Various research efforts may also add additional testing procedures such as collection of tail hairs, ear punches, or drawing additional blood. Data from both the calf and adult operations is collected and stored in a computerized database. The current database includes all animals from 1966 to present.

4. Population Census

Following the completion of the roundup and while helicopters are still available, an aerial survey is conducted to count the bison that have not been captured. This is done prior to the release of the captured bison back into the park. The total number of bison, in particular, the number of calves counted is the major determinant of the number bison culled in the following year.

5. Distribution of Excess Bison

The Park does not have money budgeted to complete this annual bison roundup. It charges recipients of the bison a fee to cover operational costs of the roundup. For example, the recovery costs go towards paying for the microchip implants, scanning equipment to read the microchips, helicopter and pilot rental, vet charges, etc. Costs are kept to a minimum to keep the price per bison down as low as possible. The average cost per bison has ranged from $250 to $450.

The Park has been rounding up and shipping live bison since 1987. A total of 1,402 bison were removed between 1987 and 2006. The bison were distributed to twenty-eight Native American Tribes (92.7%), one Native American University (1.4%), four State Parks (1.1%), two conservation groups (4.7%) and one bison to Grand Teton National Park (0.7%). (NPS WICA Resource Management Records)

A complete list of bison distribution from 1987 – 2006 is provided in Appendix E.

In 1994 the Park began working with the Inter-Tribal Bison Cooperative (ITBC) for handling the distribution of its bison. Instead of dealing with individual tribes and signing a Memorandum of Agreement (MOA) with each tribe, the park worked with ITBC requiring a

single MOA. The Park superintendent has the discretion to distribute bison to other government agencies, public zoos, universities, tribes, etc.

6. Alternative Methods of Bison Population Management

A number of options for bison population management have been examined in the preparation of this plan. The following list of alternatives were considered, but not implemented. If in the future, the current management action proves unsuccessful, one or a combination of these may be used, after appropriate environmental compliance is completed:

a. Mimic natural cull by shooting bison.
b. Herd bison in to Custer State Park and then sell them in conjunction with the Custer State Park bison auction.
c. Use of reproductive control.
d. Use of a buffalo jump.
e. Reintroduction of natural predators.
f. Poisoning.
g. Round up and slaughter.

In addition to the population control measures, the park also faces the task of the distribution of culled bison. To date, the park has found enough willing takers for bison that this has not been an issue. However, the following scenarios were examined in an effort to determine applicability of bison distribution in the future:

a. Donate bison to private organizations such as tribal schools or private individuals.
b. Conduct a public auction, which may compete with private enterprise.
c. Slaughter animals and donate the meat to food programs.
d. Slaughter animals and leave them on the ground within the park for scavengers.
e. Slaughter animals and burn or remove them to a landfill.

B. Water Management

As previously stated, there are 3 perennial streams in the park (Figure 3), Highland Creek, Cold Springs Creek, and Beaver Creek. In addition, the Park has approximately 100 known springs, not all of which sustain a yearly water flow. Due to the available water sources scattered throughout the park, supplemental watering has not been necessary. However, in periods of prolonged drought, the Park may elect to provide water for wildlife.

C. Disease Management

Other than testing for brucellosis at its annual roundup, WICA does not routinely test its bison for diseases. During the October roundup, veterinarians have an opportunity to view the bison at close range while the bison are confined in the processing chutes. When the potential for a disease is detected or determined, management will react accordingly, on an as needed basis and within agency and Park policies. Additional tests may be run if the situation warrants. If a disease outbreak is detected, the use of biologicals (pharmaceuticals derived from biological sources such as bacterins, serums, toxoids, and antitoxins) may be used. Recommendations from the DOI Bison Working Group (See Appendix F) will be reviewed with the NPS wildlife veterinarian staff, part of the Biological Resource Management Division (BRMD) before action is taken.

Other times of the year park staff and visitors often report injuries or unhealthy looking bison to Resource Management staff. Resource Management staff will follow up with additional data collection, and for disease purposes, consult with NPS wildlife veterinarians. The circumstances will be reviewed with the veterinarian staff and a determination will be made as to further actions to be taken. These may include continued monitoring or euthanizing the animal. Euthanasia is categorically excluded under this plan.

If a bison is euthanized, a necropsy may be performed. A necropsy report form (Appendix G), developed by the Biological Resource Management Division (BRMD), will be completed for the animal. Gross examination along with blood and tissue will be collected if conditions permit. Samples will be shipped to BRMD in Fort Collins, Colorado. Appendix H contains the instructions for shipment of samples taken.

As previously stated, other than testing for brucellosis, additional tests are performed on a case by case basis. Bison being shipped to other states may have additional tests completed, depending upon state requirements, as these may change from state to state. If practical, the park will have the additional tests completed on the bison before they are transported, otherwise it is the responsibility of the recipient to complete the tests before they can be accepted into the state to which the animals are transported.

Brucellosis is tested for at each roundup. The last documented case of brucellosis in a park bison was in 1984. Bovine tuberculosis has never been found in the park or surrounding area, however the park is occasionally requested to test for this infectious disease. Numerous states require this test to be completed before bison are permitted to be transported into their respective states.

If disease is suspected as the cause of death, the following tissue samples should be collected: skin, heart, lymph nodes, spleen, stomach(s), small intestine, large intestine, cecum, (or ileocecocolic junction), liver, lungs, kidneys, urinary bladder, reproductive organs (ovaries, uterus, vulva or testicles and penis), adrenal glands, thyroid glands, and brain (or brainstem). Other tissues may be taken and a complete list and necropsy procedures are listed in Appendix G.

At this time, the State of South Dakota is a Certified (Brucellosis) Free State and an Accredited (TB) Free State (South Dakota Animal Industry Board 2004).

Vaccination of bison for brucellosis was discontinued in 1997. The park has elected not to vaccinate bison for any other diseases in an attempt to allow the population to be as free from human intervention as possible.

D. Bison Genetics

Though bison may be considered a conservation success story, long-term survival of bison free of cattle gene with high genetic diversity, may require the development of effective genetic management strategies (Halbert, 2003).

It is estimated that approximately 30 million bison once roamed North America (Halbert 2003 cited McHugh 1972; Flores 1991). Research indicates (Halbert 2003 cited Coder 1975) that at the lowest point in 1888, there were only 541 bison in existence in the United States and only about 85 alive in the wild in Montana, Dakota Territory, Wyoming, Colorado and Texas. Of these 85 wild bison, all except a small herd in Wyoming were completely hunted

out of existence. A small number of individuals effectively served to save the species. They were as follows:

- James McKay and Charles Alloway (McKay-Alloway Herd)
- Charles Goodnight (Goodnight Herd)
- Frederick Dupree and Scotty Philips (Dupree-Philip Herd)
- Charles "Buffalo" Jones (Jones Herd)
- Charles Allard Sr. and Michael Pablo (Pablo-Allard Herd)
- *William Hornaday (National Zoological Park Herd)-bison from private herds*

Nearly all bison that exist today are descendants of the 76-84 bison used to found the above mentioned 5 private herds in the late 1880's and a remnant population from Yellowstone National Park of no more than 30 bison (Halbert 2003 cited Garretson 1938; Coder 1975; Meagher 1973). All five of the above ranchers either experimented with domestic cattle-bison crosses or purchased bison from others who were involved in such experiments.

Most of the current population of approximately 300,000 – 500,000 bison in North America are privately owned. There are less than 7,000 bison in five National Park herds and less than 1,600 bison in five US Fish and Wildlife Service herds. The vast majority of public and most private bison herds are derived from these federal herds, with the exception of the Canadian public bison herd. Unlike public populations, private herds are often managed specifically for such traits as growth rate and meat production, and many have known bison-domestic cattle hybrids. Halbert noted more than 50 private herds have been examined to date and all but one has evidence of cattle gene introgression (Derr unpublished data). Long term maintenance of bison genetics variation depends on the management practices of federal bison herds (Halbert 2003).

The goal of bison conservation is to maintain the bison as a wild species in contrast to the domesticated state. Ideally, 'wild' bison would be non-domesticated, subject to evolutionary adaptation through natural selection, and normally reside in free-ranging, naturally regulated herds within original bison range. It is evident, however that most herds are confined by fences or socio-political forces in habitats of varying sizes, sometimes outside of original range, and are subject to varying levels of management intervention by humans. Therefore, the realities of the developed landscape and existing human settlement limit opportunities for conserving bison under completely natural conditions (Boyd 2003).

A more recent bison conservation movement is being pushed forward by the Wildlife Conservation Society. Their "Vermejo Statement – May 2006" further defines bison restoration by stating "Ecological restoration of the North American bison will occur when multiple large herds of plains and wood bison move freely across extensive landscapes within all major habitats of their historic ranges, interacting in ecologically significant ways with the fullest possible set of other native species, and inspiring, sustaining and connecting human cultures. This restoration will only be realized through a collaborative process engaging a broad range of public, private, and indigenous partners who contribute to bison recovery by: maintaining herds that meet the criteria for ecological restoration, as well as herds that contribute in some significant way to the overall ecological restoration of bison, regardless of size". The park bison herd will be contributing in a significant way with its disease free and cattle gene free animals. Another way the park bison herd can contribute to this continent

wide conservation effort is by "maintaining the health, genetic diversity, and integrity of the species" as mentioned in the Vermejo Statement.

From 1997-2002, 3,378 bison from 10 federal bison populations were tested for evidence of domestic cattle introgression using both mitochondrial and nuclear loci. Nuclear introgression was investigated using 15 nuclear microsatellite markers with non-overlapping allele size ranges in bison and cattle. Additionally, genetic diversity within and between federal bison populations was evaluated using an additional 54 unlinked polymorphic nuclear microsatellite markers distributed throughout the bison genome (Halbert 2003).

The study identified three herds - Grand Teton National Park (GRTE), Wind Cave National Park, and Yellowstone National Park (YELL) without evidence of nuclear or mitochondrial domestic cattle introgression, with only two of those (WICA and YELL) having a greater than 99.9% probability of detection of cattle introgression (the small sample size for GRTE precluded a high confidence in the lack of detection of cattle introgression). In addition, the GRTE herd received bison from Theodore Roosevelt National Park, which has evidence of nuclear domestic cattle introgression.

The WICA and YELL bison populations have high levels of genetic variation compared with other federal populations. The 293 bison samples examined from WICA alone contained 74% of the total bison genetic variation (measured by the number of alleles) and had the highest average level of heterozygosity of all the federal populations examined (Halbert 2003). The WICA and YELL populations should be given conservation priority and maintained in isolation from other bison populations based on their high levels of genetic variation and the absence of detectable domestic cattle introgression. Halbert (2003), also underscores the importance of maintaining the WICA population in isolation from the adjacent bison herd in Custer State Park (CSP), from which both mitochondrial and nuclear evidence of domestic cattle introgression has been detected (Ward et al. 1999; Ward 2000).

In an effort to address the management issues and concerns with bison crossing into either park, the parks' have signed a Memorandum of Understanding (Appendix J) that outlines the course of action that will be taken if exchanges occur between CSP and WICA.

Population size, population structure, levels of genetic variation, and the incidence of domestic cattle introgression must be considered in the management of federal bison populations. Most federal bison populations have moderate levels of genetic variation, an indication of genetic fitness that justifies the maintenance of these populations as closed herds. Low levels of domestic cattle introgression in many of these populations underscores the need to consider the incidence of domestic cattle introgression when moving bison among herds (Halbert 2003).

Nearly all bison have been sampled at Wind Cave National Park, providing a unique platform to investigate breeding structure in this herd and opportunity to extrapolate this information to other bison herds to aid in management decisions (Halbert 2003).

In addition to the above mentioned research, a report furnished to Mr. Aaron Rothstein (researcher working at WICA), dated January 4, 1984 states, "In my opinion, the Wind Cave herd, at this period in history, is not suffering from inbreeding depression. This is marked contrast with data on some of the other herds". This report was submitted by Clyde Stormont, Ph.D., director of Stormont Laboratory Services in California. In 1993,

approximately 10 years later, another effort to evaluate the genetic integrity of the Wind Cave bison herd was completed by Stormont Lab. Stormont states "the average score is 3.54 (out of 7 loci that were evaluated) which is not as high as the 1983 average of 4.00 but, comparatively speaking, is still quite high when compared with other public herds. In other words, the WCNP herd continues to maintain a high degree of heterozygosity" and genetic fitness.

Gross and Wang (2005) simulated dynamics of NPS bison herds to evaluate impacts of management actions on genetic diversity retention. As a result, bison herds with more than 400 animals had a high probability of retaining genetic heterozygosity for 200 years. Larger herds were needed for high probabilities of retaining genetic alleles. Through these simulations, they showed that the choice of population control strategies can have large impact on retention of genetic variation when population sizes are small (i.e., 400 or less), but have less influence in large population sizes (i.e., 800-1,000). The Park's strategy of removing young animals increases generation time and most effectively retains genetic variation.

E. Conservation Herd(s)

Evidence suggests that additional conservation and management efforts are needed to ensure the long term health of the plains bison as a species. Generally, bison herds are threatened by small herd size, unnatural culling practices, and cattle gene introgression. Among plains bison, the only public herds known for which there is a good probability of genetic purity are Henry Mountains, Yellowstone National Park, Wind Cave National Park (Halbert 2003) and Elk Island National Park in Alberta, Canada (Ward et al. 1999). Unfortunately, with the exception of YELL, all of these herds are limited to small population sizes. Previous and recent work (Gross and Wang 2005) directed specifically at federal herds indicates that: 1) Bison herds with fewer than about 400 animals are unlikely to meet a long-term goal of achieving a 90% probability of retaining 90% of genetic heterozygosity for 200 years; and 2) A moderate bison population size - about 1000 animals – is necessary to meet a long-term goal of achieving a 90% probability of retaining 90% of allelic diversity for 200 years.

Halbert (2003) indicated that in addition to being free of cattle introgression, both WICA and YELL herds also have high levels of unique genetic variation in relation to other federal populations. As such, these populations should be given conservation priority and be maintained in isolation from those populations identified in this study and by Ward (2000) as containing domestic cattle introgression.

Since the WICA bison herd contains high levels of genetic variation and no evidence of domestic cattle introgression, the necessity of starting additional conservation herds was imperative (Boyd 2003, Halbert 2003, Gross and Wang 2005). The founding and maintenance of new herds managed for conservation of the species helps to ensure the future preservation of pure bison germplasm by both expanding the total metapopulation size and building redundancy into the network of populations thereby insulating against risk.

With this in mind, the park entered into a Cooperative Agreement (Appendix I) with the American Prairie Foundation in 2006 with the objective of establishing a partner herd that is genetically pure and managed for conservation and that will contribute to the long term conservation of bison and the security of the Wind Cave bison population.

The American Prairie Foundation and the World Wildlife Fund, launched the American Prairie Restoration Project in 2002 with the long-term goal of creating a large-scale prairie reserve and restoring to it the full complement of historic biodiversity. As of January, 2006 the project's holdings included 31,000 deeded and leased acres. The American Prairie Foundation plans to utilize its private and leased grazing capacity to expand the herd to a minimum size of 400 animals over the short term, and expand the population as additional land and forage become available over time.

Other agreements may be established to further protect the genetic variation of the Wind Cave bison herd and for the conservation of the species.

F. Bison Research

With the exception of population size, the Park bison are lightly managed. One park goal is to replicate the natural prairie system as closely as possible. The ecological role of bison in the prairie ecosystem is not well understood, including their influence on vegetative seral states. The Park is working to gain a more accurate assessment of the carrying capacity of the Park bison range. Additional information is needed on the interaction of bison and other prairie species. Research also needs to continue to address the long-term viability of the population given the restricted area of the Park.

G. Disposition of Bison Parts

The Park has maintained the practice of leaving wildlife where they lie at death. In some instances animal carcasses are moved to reduce the potential for poaching of parts, such as when animals die close to a road or trail, regardless of the cause of death. Requests for animal parts from Tribes or Tribal members will be honored, to the extent possible. When there are no requests carcasses will be left in the field and skulls may be crushed to reduce potential for poaching.

IV. Compliance

In the NPS, categorical exclusions are applicable to actions that are not considered major federal actions and that have no measurable impacts on the human environment. If, however, these actions may have measurable or significant impacts, categorical exclusions would no longer be applicable. The purpose of this Bison Management Plan is to codify the procedures for bison management. No major actions or impacts were identified during the development of this plan and compliance documentation is contained in Appendix K.

V. Planning Team Participants

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Appendix A. Significance of Bison as a Resource

Bison as an Ethnographic Resource

The bison was a keystone element of the Great Plains for nearly 10,000 years, providing sustenance and materials for many on North America's original human residents, and staple food for early explorers, fur traders, and early European settlers. The increasing human pressures of market hunting for meat to provision the fur trade, hides for the robe trade, and indiscriminate killing resulted in the near-extinction of the species by the 1880s (Boyd 2003 cited Roe 1970, Kay 1994, Isenberg 2000).

1. Native American Indians

   It is not an exaggeration to say that Wind Cave National Park is one of the most sacred and culturally significant areas of the Black Hills to the Lakota and Cheyenne (Albers 2003). Wind Cave is also a location associated with a complex and changing history of human occupancy, which extends back to prehistoric times.

   Many Lakota believe they are descended from the *Pte Oyate* (Buffalo Nation), and like their forbearers, they came into existence in the subterranean world and reached the earth's surface through a cave opening. The Lakota genesis story of Tlkahe is widely associated with Wind Cave, and in fact, today, this is the one most commonly told in relation to this cave (Albers 2003).

   Of all animals, the bison was clearly the most important historically to the Lakota and Cheyenne, both as a provisioner of their life necessities and as an important spiritual presence. The Lakota considered the bison the chief of all the animals, and a penultimate metaphor for the workings of the cosmos (Albers 2003).

   In Albers (2003; Lame Deer and Erdoes 1972), Lame Deer speaks about the close link between human and bison:

   > We Sioux have a close relationship with the buffalo. He is our brother…the buffalo is very sacred to us. You can't understand about nature, about the feeling we have toward it, unless you understand how close we are to the buffalo. That animal was almost like a part of ourselves, a part of our souls (Albers 2003).

   It cannot be emphasized enough how much bison were, and still are, revered by the Cheyenne and Lakota, not only in a practical way as a source of food, shelter, and medicine, but spiritually as a presence embodied in the very essence and workings of the cosmos. In the traditions of both tribes, bison are especially associated with the breath of life, winter, and the North Wind, but they are also associated with the sun, spring, and the East or South Wind. Many of the most sacred stories about them are located at sites in and around the Black Hills, including the Race Track and Wind Cave (Albers 2003).

   The park is characterized as "the bison's home, their stomping grounds, and the place where they first returned after being extirpated from the area in the 1880's. So much of the park's identity in tribal traditions is connected to the bison, and in European American traditions, it remains a focus as well" (Albers 2003).

   When Wind Cave National Park celebrated its Fiftieth Anniversary in 1953, a Lakota delegation from the Pine Ridge Reservation was invited to attend the festivities. As a way of

honoring the event, the Lakotas adopted the park's superintendent, Earl M. Semingsen and named him Tatanka Tokahe [First Bison Bull]. Two things are significant about this name. On the one hand, it associates the park with bison, a culturally important connection for the Lakotas, who have long believed that Wind Cave is home of the Buffalo Nation; and on the other, it refers to the name of the first human to emerge from the subterranean depths of the Black Hills through the portal that many Lakotas identify as Wind Cave (Albers 2003).

The Park not only has special significance to the bison and the Cheyenne and Lakota tribes but it also has a history with a number of other tribes. The federally-recognized tribes with the most important historical and cultural relations to the lands that make up WICA include: The Northern Arapaho Tribe of Wyoming, The Cheyenne-Arapaho Tribes of Oklahoma, The Northern Cheyenne and the Fort Peck Assiniboin/Sioux tribes of Montana, the Oglala Sioux, Rosebud Sioux, Lower Brule Sioux, Cheyenne River Sioux, and Standing Rock Sioux tribes of South Dakota (Albers 2003).

2. Euro-Americans

Bison are also part of the modern day Euro-American culture. The American bison is a North American icon immortalized as a symbol on currency and stamps, and institutionalized as a logo by school sports teams (e.g., the Hot Springs, South Dakota High School "Bison"), government departments (including the National Park Service), and businesses. There are few animals that carry with them so much history, political significance, and cultural importance as bison. It is a symbol closely associated with the American West and certainly special significance to the Native American Indian Tribes (Boyd 2003).

Bison as a Legislated Resource

Bison are also closely associated with the Park and the National Park Service since it was one of the reasons why the Park land was set aside. In 1911, J. Alden Loring was directed by the American Bison Society to survey South Dakota "for the purpose of selecting a suitable tract of land for a National Game Reserve." (Loring 1911). The Wind Cave Game Preserve, administered by the USDA Bureau of Biological Survey, was established on August 10, 1912 based on Loring's report. In November 1913 a herd of fourteen bison (6 bulls and 8 cows) were brought to the game preserve. This initial group was a gift from the New York Zoological Society through the American Bison Association. Six more bison (2 bulls and 4 cows) were brought to the game preserve from Yellowstone in June of 1916. In 1935 the Wind Cave Game Preserve was transferred from administration by the USDA Bureau of Biological Survey to the Department of Interior, and became part of Wind Cave National Park. These 20 bison are the "founders" of the WICA bison herd.

To this day, bison remain one of the species of wildlife that visitors come to see and enjoy at WICA. Annual Park visitation is approximately 800,000. It is important from an education standpoint that visitors and school groups understand the history and significance of keeping bison on the mixed grass prairie of Wind Cave National Park.

Bison as a Natural Resource

Considering the special place in the culture, history and hearts of so many people it is imperative that the bison within Wind Cave National Park are managed in a respectful and considerate manner while adhering to NPS and Park policies.

Bison are an essential component of Wind Cave National Park because they contribute to the biological, ecological, cultural, and aesthetic purpose of the Park. Finish this section with the ecological role of bison in the great plains and the value wica bison in the national gene pool.

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Appendix B. Biological Information for Bison

General Description.

The American bison, is the largest native land animal in North America. A mature bull can stand six feet at the shoulder, up to ten feet long, and can weigh between 1000-2000 pounds. Females are smaller, around five feet tall, and can weigh up to 1,400 pounds. Bison have massive head and forequarters, a large shoulder hump, long shaggy brown fur on the head and shoulders, a mane and beard under their chin and a long tail with a tuft of hair at the end. Bison horns curve upward, with those of the bulls being larger and heavier than those of cows. A bull's hair is shaggier on the forelegs, head, throat, and chin, thus accentuating their size. In late fall, the bison's fur is dark brown, and as winter progresses, the fur pales. As spring progresses, bison shed old hair, as the hair loosens and hangs in patches until it is completely shed and replaced with new hair.

Historic Range.

The American bison once was found in most of Canada, the United States and parts of Mexico (Chapman and Feldhamer 1982; Meagher 1986; Reynolds and Gates 1991). Today, bison occur in isolated populations in parks and preserves, other public lands, and on private ranches (Chapman and Feldhamer 1982; Finch 1992; Halloran and Glass 1959; McHugh 1958; Meagher 1986; Van Gelden 1982; Van Vuren 1984; Pfeiffer and Hartnett 1995; Pfeiffer and Steuter 1994).

Life History.

Bison are a species that breed seasonally and exhibit behavioral characteristics of rutting season. Female bison have a breeding cycle of approximately 3 weeks' duration (Banfield 1974; Chapman and Feldhamer 1982), however, unseasonal estrus and mating sometimes occur (Banfield 1974; Chapman and Feldhamer 1982; McHugh 1958). When mating season begins, male bison move into female groups and select a female. They then "tend" the female. Males tend a female by staying between her and the rest of the herd. Tending can last for a few minutes or for several days. If a female isn't interested in a male, she will walk away. Males will threaten and sometimes attack other males that try to get too close to a female he is tending. Fights between males can involve headbutting, shoving, or locking horns. Cows without calves are typically tended first. As the rut progresses, cows with older calves and then cows with young calves are tended. The pre-rut is initiated by the onset of frequent sexual investigations. These are characterized by a decline in the sociality of bulls and the entry of bulls into mixed herds. The pre-rut usually begins about the first of June and continues through mid-July. The rut extends from approximately mid-July through mid-August. Most breeding occurs during this period (Petersburg 1973). The post-rut is initiated by a major efflux of large old bulls from herds. As it progresses, more bulls leave herds and return to their former ranges. Rutting activity declines, but often involves young bulls. Some breeding occurs during the post-rut. The post-rut begins in mid-August and continues through late September. Although these time periods are a good general guide, they are not a rule, as bison have been observed exhibiting rut and breeding behavior throughout the year within the park.

The gestation period is approximately 270 days (Chapman and Feldhamer 1982; McHugh 1958; Meagher 1986). Most cows give birth to one calf, but on rare occasions twins are observed

(Chapman and Feldhamer 1982; Meagher 1986). Bison generally give birth two out of three years (Chapman and Feldhamer 1982; McHugh 1958). Most bison young in the Park are born between mid-April to mid-May, but calves have been born from March to August or even later. They are able to stand when only a few minutes old and move with their mother within a few hours. The mother and her calf will stay isolated from the herd for a couple of days. Calves begin grazing at about a week of age. The cow nurses her calf for at least 7 to 8 months and most calves are weaned by the end of the first year (Meagher 1986). Young calves have a reddish coat, which begins to darken at about two months of age, and by four months of age, it is dark brown. At about two months, the calves will begin to develop shoulder humps and horns.

Bison cows generally do not give birth until the age of three and usually cease by sixteen or seventeen. Within the Park, cows as old as twenty-one have been documented with calves. Green and Rothstein (1984) determined that there were no significant differences in calving rates among age classes of 3-≥16 years of age. Although most cows calve every year, some skip years or are barren. At WICA, calves born alive generally survive to maturity, as there are no real predators. Bulls attain sexual maturity well in advance of becoming part of the active breeding population (Meagher 1973), which is about six years of age.

Bison are relatively long-lived, compared to other ungulates. Tagged bison within the Park have been documented to live longer than 20 years. A WICA study by Green and Rothstein (1984) cited personal communication by park staff that an average of ten bulls per year die in the park from old age and wounds from the rut. Using the bull population at the time (130-150) a bull mortality of 5-8% was estimated. Data from 2003, indicate that of 24 mortalities, 11 were bulls, 11 were cows and two were calves.

Bison within the Park do not remain in a single herd, but scatter into small groups or in groups numbering up to about 50 animals or more, with each group having a dominant bull or cow. Bison can be found throughout the Park in all seasons. They will spend the warm daylight hours resting, chewing cud, and wallowing in dirt. The most active parts of the day are early morning and late afternoon.

Most of the bull groups range in size from 1 to 15, but can occasionally number higher. Most of the lone bulls observed in the park are 8 or more years old. These bulls are the primary display animals in the park. Leadership is provided by old bulls.

Bison may appear slow and even clumsy, but they are quite agile, fast, and have exceptional endurance for such large animals.

Historically, the main predators of bison were gray wolf (*Canis lupus*) (Carbyn 1987; Chapman and Feldhamer 1982; Herman and Willard 1978; Reynolds and Hawley 1987), grizzly bear (*Ursus arctos horribilis*), and coyote (*Canis latrans*) (Chapman and Feldhamer 1982). Within the Park, they have no real predators, as wolves and bears were extirpated from the Park area in the early 1900s. Mountain lions and coyotes, although found within the Park, are not an inimical factor to bison.

Habitat.

Prior to European settlement bison occurred mainly on the central grasslands of North America, but could be found in a wide array of habitats from semi-desert to boreal forest (Meagher 1986). Today, bison occupy multiple habitats represented by natural and captive environments in which they are managed.

Bison in Wind Cave National Park regularly utilize the mixed-grass prairie of the Park mainly consisting of little bluestem (*Schizachyrium scoparium*), big bluestem (*Andropogon gerardii*i), Kentucky bluegrass (*Poa pratensis*), and western wheatgrass (*Pascopyrum smithii*) (Coppock et al 1983), but will commonly be found within all Park habitats, including forested areas which are used for shade, escape from insects, and forage locations in winter when open areas are covered by deep snow (Boyd et al 1986). Meagher (1978) found that bison survive in open areas with several feet of snow. Bison also use forested areas and physical features for cover in severe weather (Boyd et al 1986).

Most bison are seasonally migratory with movements in both direction and elevation (Chapman and Feldhamer 1982; Meagher 1973; Shaw and Carter 1990). During historical times, large herds of bison commonly moved southward 200 miles or more to winter range (Banfield 1974). With the small size of the Park, direction and elevation movements between summer and winter ranges are difficult to predict. The greatest influences on bison movement within the Park are supply and accessibility of forage, water, shelter, insect harassment, and weather conditions and temperatures.

In mountainous areas, altitudinal movements to lowland winter range in fall and to higher summer range in spring are quite common. Large, open mixed-grass prairies may also be chosen in summer for relief from insects. Bison, particularly cows, show strong affinity to traditional winter range (Meagher 1973; Shaw and Carter 1990). Shaw and Carter (1990) found that older cows are likely to seek new winter range and return to those areas in subsequent winters.

Management Considerations.

a. Seed dispersion

   McHugh (1958) attributed the dissemination of seeds of buffalograss (*Buchloe dactyloides)*, cocklebur (Xanthium perforatum), and St. Johnswort goatweed (Hypericum perforatum) throughout the National Bison Range to the thick hair of bison, particularly on the head and forequarters. Bison, as well as other species, aid in the dispersion of seeds by ingestion. In a study of buffalo chips at Wichita Mountains Wildlife Refuge, 219 of the seeds found successfully germinated. Bison may accelerate seed dispersal to burned sites because bison are attracted to recently burned areas (Collins and Uno 1985).

b. Forest Effects

   Localized stands of timber may be considerably affected by bison horning and thrashing during the rut and at other times. McHugh (1958) estimated that 51 percent of lodgepole pine in some areas of Yellowstone National Park has been horned by bison. Such activity may inhibit succession of grassland to forest (Chapman and Feldhamer 1982).

c. Wallows and Erosion Potential

   Where bison trails or wallows (concave disturbances formed as bison paw the ground and roll in the exposed soil) are cut into steep hillsides, considerable water and wind erosion can occur. Hillside trails can serve as drainage channels, effectively lowering the water table in upland areas and causing a change in the vegetation. Where trails cut near the top of steep, sandy hills, erosion and slippage may produce barren areas. However, by creating trails through different habitats, bison help provide access corridors for many species of mammals, including humans (Chapman and Feldhamer 1982).

Bison wallows can serve as water catchments on flat terrain. In Oklahoma bison wallows have been observed to hold water for prolonged periods during the spring rainy season. Such small ponds become available to both vertebrates and invertebrates. These water-holding wallows may also enhance growth of specific vegetation such as ruderal species and species adapted to wet habitats (Chapman and Feldhamer 1982; Uno 1987). On the Wichita Mountains Wildlife Refuge, ruderal species such as Japanese brome and false-pennyroyal (Hedeoma hispida) had highest cover values within bison wallows. Other common taxa within the wallows were Torrey rush (Juncus torreyi), purple ammania (Ammannia coccinea), lythrum (Lythrum spp.), and taperleaf flatsedge (Cyperus acuminatus), all of which are species adapted to wet habitats (Collins and Uno 1985).

d. Diseases

1) Anthrax is an infectious disease caused by the bacteria (*Bacillus anthracis*) and outbreaks cause sporadic mortality in northern bison herds. Anthrax is not uncommon in South Dakota. In 2005 and 2006, Anthrax was documented in bison herds, however, there have been no documented occurrences of anthrax within the Park.

2) Tuberculosis is caused by the bacterium *Mycobacterium bovis*. It is infectious to all warm-blooded animals, including people. All species and age groups of animals are susceptible to *M. bovis*, with cattle, goats, and pigs most susceptible. Bovine TB may also be encountered in deer, elk, bison, and birds (Faries and Davis 1997). In Wood Buffalo National Park, 50 percent of bison may be infected by tuberculosis, a chronic infectious disease (Meagher 1986). Tuberculosis in a herd of bison for more than 26 years did not appear to interfere with herd productivity. However, the importance of tuberculosis as a mortality factor is difficult to determine for large bison herds (Chapman and Feldhamer 1982).

3) Brucellosis is an infectious disease caused by the bacteria *Brucella abortus*. Brucellosis it is a costly disease of ruminant animals causing abortion and may also affect humans. Although brucellosis can attack other animals, its main threat is to cattle, bison, and swine. The disease is also known as contagious abortion or Bang's disease. In humans, it's known as undulant fever because of the severe intermittent fever accompanying human infection (USDA APHIS 2004). Infected bison may shed *brucella* organisms which could contaminate feed and water. The role of brucellosis and its affect on reproductive activity in bison is difficult to determine due to the lack of data on the incidence of abortion in bison (Chapman and Feldhamer 1982; Meagher 1973).

   Brucellosis was first discovered in the Wind Cave bison herd in 1945. After several attempts at eradication over time, the disease was eliminated in 1985. There have been no positive reactors since.

   Elk have also been documented in the Park with the disease, with the last elk testing positive for brucellosis was in 1980.

   The damage done by the infection in animals-decreased milk production, weight loss, loss of young (induce cows to abort their calves), infertility, and lameness, makes it one of the most serious diseases of livestock. The rapidity with which brucellosis spreads and the fact that it is transmissible to humans makes it all the more serious. The disease is caused by a group of bacteria known scientifically as the genus *Brucella*. In cattle and

bison, the disease currently localizes in the reproductive organs and/or the udder. Bacteria are shed in milk or via the aborted fetus, afterbirth, or other reproductive tract discharges.

4) Foot and Mouth Disese (FMD) is a severe, highly communicable viral disease of cattle and swine. It also affects sheep, goats, deer and other cloven-hoofed ruminants. FMD does not spread to humans. FMD is characterized by fever and blister-like lesions followed by erosions on the tongue and lips, in the mouth, on the teats, and between the hooves. Many affected animals recover, but the disease leaves them debilitated with severe losses in the production of meat and milk.

5) *Salmonella enteritis* (Dublin strain of Salmonella) is a bacterial disease with a rising prevalence in the cattle industry and was found in Custer State Park in 2003. It is most common in dairy calves one to ten weeks of age, but can also be seen in adult dairy cows and beef cattle. Salmonellosis has a serious economic impact on the cattle industry worldwide. Livestock mortality, treatment costs, abortion, reduced production, discarded milk and reduced consumer confidence all contribute to the cost of salmonella to cattle industries. Fecal contamination of feed and water from shedding to naïve animals is the most common source and route of infection. Ravens, opossums, pigeons, rats and mice can also serve as carriers or vectors. Once ingested, salmonellae colonize and multiply in the intestine resulting in acute infection. Typical clinical signs of acute salmonella enteritis include fever and severe watery diarrhea with subsequent rapid onset of dehydration. The diarrhea is usually putrid and may contain blood and mucus. *Salmonellae* produce toxins that can contribute to gut damage and have systemic effects. If sufficient damage occurs to the intestinal lining, the bacteria may enter the bloodstream, resulting in septicemia, and the bacteria can spread to the brain, lungs, joints, uterus (causing abortion) and other organs.

6) Blue Tongue (BLU) is a viral disease of sheep that is transmitted by biting midges of the Culicoides family. The disease affects cattle, sheep, goats, bison, deer, and antelope. The disease is characterized by a reddening of the mucous membranes of the mouth and nose which is accompanied by excessive drooling and, initially, a clear nasal discharge which becomes blood-stained. Swelling of the lips and tongue occurs which can extend to the whole head. There is profuse diarrhea in some cases. In addition there is reddening and swelling of the hoof junction leading to extreme lameness and reluctance to move. In rare cases the tongue turns blue.

7) Epozootic Hemmorghagic Disease (EHD) is an acute, infectious, often fatal viral disease of some wild ruminants and is characterized by extensive hemorrhages. It has been responsible for significant epizootics in deer in the northern United States and southern Canada. The mode of transmission of EHD in nature is via a *Culicoides* biting fly or gnat, with *Culicoides variipennis* the most common vector in North America. A common observation in outbreaks involving large numbers of deer is that they are single epizootics which do not recur. Die-offs involving small numbers of deer occur almost annually, and the disease appears to be enzootic in these areas. All documented outbreaks of EHD have occurred during late summer and early fall (August-October) and have ceased abruptly with the onset of frost.

8) Bovine viral diarrhea virus (BVDV) is a disease of cattle throughout the world and can cause clinical disease in sheep. In addition, wild ruminants (mule deer, elk and bison) may harbor and transmit the virus without exhibiting significant disease.

   The BVDV can cause a variety of clinical diseases, including respiratory and intestinal system difficulty, resultant in the shedding of active virus. In addition, the BVDV causes an immune suppression by destroying white blood cells and a chronically infected animal with a suppressed immune system may be diagnosed as mucosal disease and eventually die. The virus may be short-lived in the environment, however, chronically and persistently infected animals are a constant source of virus for other animals in close contact. The BVDV may cause abortion any time during pregnancy and fetal exposure during the fourth and sixth months of gestation may cause congenital defects. Because the fetal immune system does not recognize the virus as foreign, the fetus may be carried to term and continue to shed the virus throughout its life.

9) Malignant Catarrhal Fever (MCF) is a viral disease of cattle and buffaloes and other species of wild ruminants. It is characterized by high fever, nasal discharge, cornea opacity, ophthalmia, generalized lymphadenopathy, leukopenia, and severe inflammation of the conjunctival, oral, and nasal mucosas with necrosis in the oral and nasal cavities sometimes extending into the esophagus and trachea. Occasionally central nervous system (CNS) signs, diarrhea, skin lesions, and nonsuppurative arthritis are observed.

10) Bovine Respiratory Syncytial Virus (BRSV) is a viral disease affecting the lower respiratory tract disease in susceptible cattle. Clinical disease is most apparent in calves and the protection against reinfection is short-lived and multiple reinfections are common. Clinical signs after a natural BRSV infection include fever, nasal discharge, coughing, rapid breathing, abdominal breathing, emphysema and death. Secondary bacterial infections, notably by *Pasteurella* species, are commonly found.

11) Johne's Disease (*paratuberculosis*) disease is a contagious bacterial disease of the intestinal tract. Johne's disease occurs in a wide variety of animals, but most often in ruminants. The bacterium that causes Johne's disease is named *Mycobacterium paratuberculosis* and is a relative of the bacterium that causes tuberculosis in humans (*Mycobacterium tuberculosis*), cattle (*Mycobacterium bovis*), and birds (*Mycobacterium avium.* Primarily, there are only two signs of Johne's Disease infection: diarrhea and rapid weight loss. In 2006, tests of bison at Badlands National Park, Theodore Roosevelt National Park, Wind Cave National Park, and Yellowstone National Park for Johne's Disease were negative.

12) West Nile Virus (WNV) is a mosquito-borne disease that was first isolated in 1937 from the blood of a woman in the West Nile district of Uganda. Since then, the WNV has been commonly found in humans and birds and other vertebrates in Africa, Eastern Europe, West Asia, and the Middle East. The WNV first appeared in the United States in 1999 in New York City and has continued to spread throughout the United States.

e. Grazing Patterns and Forage Utilization

Bison are attracted to grassland sites altered by black-tailed prairie dog (*Cynomys ludovicianus*). Bison often feed selectively near the perimeters of colonies. These areas are constantly clipped by black-tailed prairie dog and, therefore, have more readily digestible

perennial grasses, with higher nitrogen concentration and greater accessibility of green tissues, than vegetation from uncolonized areas. Consequently, black-tailed prairie dog colonies may receive a disproportionately high amount of bison use. Prolonged grazing pressure on colonies may result in changes in plant composition (Cid et al 1991; Coppock et al 1983; Coppock and Detling 1986; Vinton et al 1993). On a mixed-grass prairie, selective use of black-tailed prairie dog colonies by bison resulted in considerably more biomass removed than by prairie dog activity alone. Additionally, selective use of plant species (i.e., grasses) by bison may contribute to an increase in forb:graminoid ratios (Koehler 1992).

A major problem currently developing within the Park is the lack of control alternatives for managing its elk inside a fenced park. The imbalance created by an over abundance of elk (700 counted during an aerial survey in January 2004), an expansion of prairie dogs (the Park population reached almost 2,000 acres in 2004), and other grazers, including bison, has direct implications on forage availability and is becoming a concern for park management. Although begun, the Park does not have a completed and implemented management plan for elk that would afford management alternatives for controlling their numbers. The Park does have an Elk Management Strategy that was completed in the mid-1980s that has served as the management plan until the present (NPS 1980).

Krausman (1996 cited Plumb 1991) described studies on northern mixed grass prairies that revealed summer diets of bison contained 83-98% grasses, 2-17% forbs, and only trace amounts of browse.

A research project is planned to begin in 2007 that will examine culling strategies for bison and elk and examine "natural" (as defined by NPS Policies) bison and elk conditions (e.g. demographics) in the vicinity of the Park and evaluate management strategies (i.e. culling) that best meet those conditions.

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Appendix C. Forage Allocation

One of the keys to successful wildlife management is the proper use of rangeland. Proper management of the land requires an understanding of the amount of dry matter forage the range can produce and the amount of forage required by each animal and the herd as a whole.

The amount of forage required by one animal unit (AU) for one month is called an Animal Unit Month (AUM). One animal unit is defined as a 1,000 lb. beef cow with or without a nursing calf with a daily requirement of 26 lb. of dry matter forage. The equivalent daily requirement for 1,000 lb mature cow is 1.0. Thus, the AUM for this animal would be equal to 790.4 lb. of dry matter forage (30.4 days x daily forage requirement). Because animal sizes and forage preferences vary and forage requirements change with the size of the animal, animal unit equivalents vary within and between species. The park has adopted animal unit equivalents of 1.2 for bison and 0.6 for elk based on park bison weights and the Natural Resources Conservation Service (NRCS) standard for elk (NRCS 1997).

With this knowledge, the proper combination of land, time, and number of animals may be chosen to ensure the sustained, long-term stability of the rangeland. The optimum number of animals on the range makes use of the forage, but still leaves enough forage for other species (i.e., birds, rodents, insects) and allows quick and complete recovery.

Carrying capacity is the number of animals the range can carry without harm to the range and is expressed in AUMs per unit area. For the park, the area is the entire park (28,295 acres), minus the water supply and valve box areas, for a total of 28,132 acres. Not all park lands produce at the same rate and, with the exception of prescribed burns, the park does not participate in practices that would cause wildlife to frequent one area more than another. Thus, some areas may be utilized more than others. Establishing carrying capacities that are too high for the land to support would result in overutilization of resources.

Stocking rate is the number of animals on the land at a particular point in time. Since the park provides wildlife habitat on a year-round basis, stocking rates must be calculated for a variety of species, particularly since they are not year-round residents. For example, bison are year-round residents and the stocking density is constant. Elk, on the other hand, move freely in and out of the park, with the highest densities during the winter months.

The carrying capacity and related stocking rates are directly tied to available forage, which in turn is influenced by environmental conditions. For example, prolonged drought weakens the viability of grasses and reduces available forage. If long-term forage production of the pasture decreases, so does the carrying capacity.

Knowing how much forage an animal needs is the first step in determining how many animals can be supported on the land available. For example, the animal unit (AU) for one bison cow animal unit may be 936 lb. of dry matter forage per month. Over a twelve-month grazing period this animal requires 11,232 lb. of forage. A herd of 400 animal units over the same twelve-month period would require 4,492,800 1b, or 2,246 tons of forage. It is the responsibility of park managers to determine whether the park rangelands can provide that much forage. In this light, the major foraging wildlife must be accounted for (i.e., bison and elk) and factored in for optimum carrying capacity.

The park determines the forage capacity by using two Natural Resource Conservation Service (NRCS 1997) methods. The first is a paper exercise using the NRCS Technical Guides for the Black Hills. The second is park research using the NRCS Double-Sampling Method. The park has approximately 28,132 acres available to wildlife, and includes areas of mixed-grass prairie, ponderosa pine forest with granite outcrops, limestone plateaus, red valleys, and hogbacks.

AUM Estimate by Seral Stage

The first method divided the park into range sites and grazeable woodland sites. The NRCS guide provides initial recommended stocking rates for each range site, in four different seral stage conditions (early, early intermediate, late intermediate, late). The guides provide initial recommended stocking rates for each grazeable woodland site in four different seral stage conditions, and three levels of canopy closure (sparse, medium, dense). Late seral stage (excellent quality) produces more "animal unit months" (AUM's) than land in early seral stage (poor).

Once the park determined how many AUM's the land can produce, the number of grazing animals can be determined for each key species. A formula calculation is used to determine the number of animals of each species the park will be able to support from the number of AUM's the park will produce. A population range for each species can be determined through this forage allocation formula.

The NRCS methodology for range land use allocates 50% of the park's AUM's for vegetation health and plant regeneration or carry over from year to year. The remaining AUMs would be split in half allocating 25% of the AUMs for the key species of bison and elk, with adjustments made for prairie dog alteration of seral stage. The remaining 25% would be allocated for other herbivores like antelope, deer, and grasshoppers, as well as what may be damaged from natural events like storms and trampling.

The AUM's estimated to be available for bison and elk (25% of total available AUM's), according to the NRCS Technical Guides, are:

Range + Grazeable Woodland (Medium Canopy)	Estimated AUMs Produced
If all park lands in Late Seral Stage	14,146
If all park lands in Late Intermediate Stage	10,065
If all park lands in Early Intermediate Stage	6,971
If all park lands in Early Seral Stage	3,448

According to this method, 14,146 AUMs is the most AUMs the park can have available for bison and elk, in the absence of prairie dogs, during years of favorable conditions (e.g. above-average precipitation), if all forested areas had a medium canopy cover. The only way to increase available AUMs, would be to decrease forest canopy cover from medium to sparse in all forested areas, increasing the amount of grasses available. However, this reduction in forest cover would not result in a direct increase in the same amount of grass cover.

AUM Estimate by Double-Sampling

The second method used by the park was through field research with the double-sampling method. The research included 36 transects placed throughout the park within each category of range or grazeable woodland site. The field testing used the NRCS methodology of estimating production in plots as well as clipping/drying vegetation from plots.

The AUM's available for bison and elk (determined from July to August of 2004) was 5,347, which was lower than expected. The field data, compared to the Seral Stage Estimate described above, would place park vegetation in between early intermediate and early seral stages. The double sampling results may be low due to overgrazing, 3 years of drought prior to the testing and/or other potential factors. It was also noted that the field sampling did not take into account the grazing that occurred prior to sampling.

Twelve more transects were added for the 2005 field season. Utilization cages were placed in association with several transects to provide information about production in the absence of grazers.

The maximum could be 12,000 to 15,000 AUM's produced, assuming the entire park was in late seral stage and sparse canopy. However, the park has only a small portion of land in late seral stage (about 10%) and does not have plans to manage toward a larger percentage of late seral stage. The average AUM's the park produces is estimated based on the NRCS technical guide, which is about 9,185 AUM's with 2,200 acres of prairie dogs. The preliminary results of the 2005 sampling found 9,192 AUM's; 2005 was considered to be an average year. Therefore, the NRCS estimate of 9,185 AUMs was determined to be representative of an average AUM for bison, prairie dogs and elk.

It was noted that the available AUM's may vary from year to year depending on the weather conditions (amount of rainfall), the number of foragers using the range, and the ability of the vegetation to recover from the previous years usage. To represent the AUM's production/availability in a drought year, the 2004 sampling data (5,347 AUM's) was recommended as a minimum for AUM production.

Custer State Park (CSP) uses a similar method which estimates base condition during the summer. From the NRCS production tables an estimate of forage production for a particular site is obtained. Based on the water year, CSP calculates a projection of what the range will produce the next summer. This is done because adjustments to populations are made in the fall (via hunting) resulting in what will be eating the forage the following summer. If the projection says they will produce 80% of normal in forage, they will reduce wildlife populations to 80% of normal. CSP water year is from October through September. The projections are about 6 months ahead.

By completing the production estimates prior to the fall, estimates of animals the range could support could also be completed in the fall. Animals that would be in excess of available projected forage would be available for removal, either through hunting outside the park, or by other means within the park.

Range condition evaluation from NRCS double-sampling

Range condition (seral stage) was evaluated for the 19 range site transect locations, using USDA Natural Resources Conservation Service double-sampling method (estimating-harvesting) as described in the USDA NRCS National Range and Pasture Handbook, Chapter 4, Inventory and Monitoring Grazing Land Resources, (c) Methods determining production and composition, (2) Estimating and harvesting.

Range site condition ratings were calculated as follows: 2 early seral, 8 early intermediate seral, 8 late intermediate seral, and 1 late seral.

Ecological site condition.

Early seral	Early intermediate	Late intermediate	Late seral
ecological site (transect #)	ecological site (transect #)	ecological site (transect #)	ecological site (transect #)
clay (#032)	clay (#025)	savannah (#17)	silty (#4)
stony hills (#11)	clay (#033)	shallow (#1)	
	overflow (#9)	shallow (#23)	
	overflow (#5)	silty (#24)	
	savannah (#2)	silty (#27)	
	savannah (#26)	stony hills (#3)	
	shallow (#29)	thin upland (#14)	
	stony hills (#10)	thin upland (#15)	

Predicting forage production

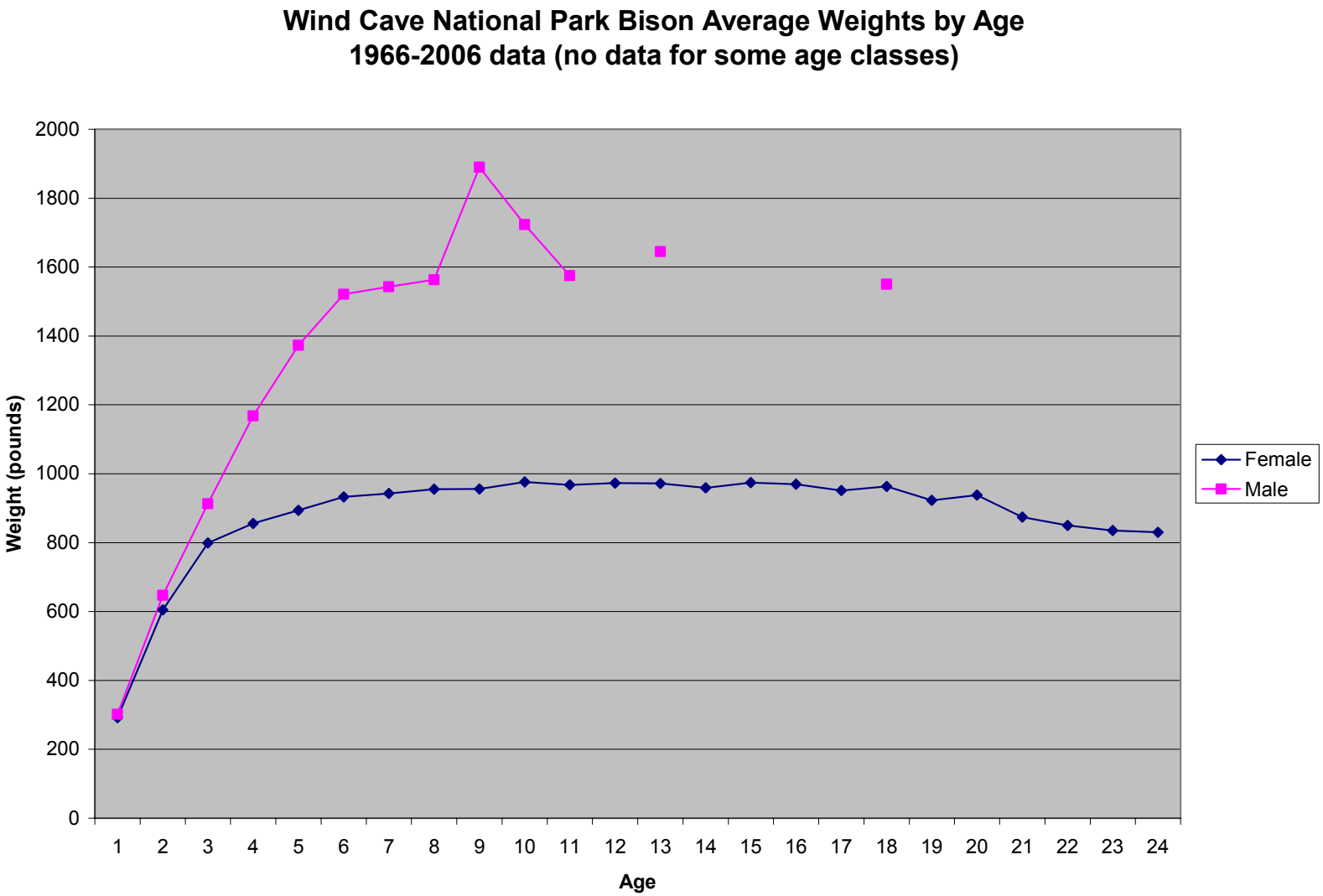
Future production can be estimated using precipitation from the two previous years to calculate the next year's production (Reece et al 1991).

Predicting production during 2005:
2003 growth year precipitation of 17.32 x .25 = 4.33
2004 growth year precipitation of 13.95 x .75 = 10.4625
4.33 + 10.4625 = 14.7925
14.7925/17.80 x 100 = 83.1039 percent
.831039 x 31,804,932 = 26,431,139 pounds estimated for 2005
.831039 x 16,897,607 = 14,042,570 pounds estimated for 2005

References:

Natural Resource Conservation Service. 1997. National Range and Pasture Handbook. Chapter 4, Inventory and Monitoring Grazing Resources. United States Department of Agriculture. Natural Resources Conservation Service.

Appendix D. Bison Weights



Appendix E. Bison Distribution from Wind Cave National Park 1987-2006

(2006) American Prairie Foundation, MT – 20 animals
(2005) American Prairie Foundation, MT – 16 animals

(1997) Antelope Island State Park, UT – 5 animals

(1994) Blue Mound State Park, MN – 2 animals

(2001) Cheyenne River Game Fish & Parks, SD – 19 animals
(2000) Cheyenne River Sioux Tribe, SD – 13 animals
(1999) Cheyenne River Sioux Tribe, SD – 54 animals
(1992) Cheyenne River Sioux Tribe, **SD** – 25 animals
(1991) Cheyenne River Sioux Tribe, **SD** – 34 animals

(1997) Choctaw Nation, OK – 18 animals
(1994) Choctaw Nation, **OK** – 20 animals
(1992) Choctaw Nation, **OK** – 36 animals

(2006) Crow Creek Sioux Tribe, SD – 10 animals
(1998) Crow Creek Sioux Tribe, SD – 12 animals
(1995) Crow Creek Sioux Tribe, **SD** – 25 animals
(1994) Crow Creek Sioux Tribe, **SD** – 12 animals

(2006) Fort Peck Tribes, MT – 20 animals

(1990) Grand Teton National Park, WY – 1 animal

(1996) Gros-Ventre & Assiniboine Tribes, MT – 20 animals

(2006) Ho Chunk Nation, WI – 72 animals
(1998) Ho Chunk Nation, WI – 3 animals

(2003) Iowa Tribe of OK – 17 animals

(1999) Kansas Dept. Of Wildlife & Parks – 5 animals

(2005) Lower Brule Sioux Tribe, SD – 135 animals
(1998) Lower Brule Sioux Tribe, SD – 9 animals
(1996) Lower Brule Sioux Tribe, SD – 6 animals
(1992) Lower Brule Sioux Tribe, **SD –** 10 animals
(1991) Lower Brule Sioux Tribe, **SD** – 49 animals
(1989) Lower Brule Sioux Tribe, **SD** – 53 animals
(1987) Lower Brule Sioux Tribe, **SD** – 29 animals

(2003) Modoc Tribe, OK – 20 animals
(1999) Modoc Tribe, OK – 12 animals

(1997) Nambe O-Ween-Ge Pueblo, NM – 5 animals

(2003) Northern Cheyenne Tribe, **MT –** 20 animals
(1994) Northern Cheyenne Tribe, **MT** – 15 animals

(2001) Oglala Sioux Parks & Recreation Authority, SD – 14 animals
(2000) Oglala Sioux Tribe (Pine Ridge), SD – 2 animals
(1999) Oglala Sioux Tribe (Pine Ridge), SD – 2 animals
(1998) Oglala Sioux Tribe (Pine Ridge), SD – 2 animals
(1997) Oglala Sioux Tribe (Pine Ridge), SD – 2 animals
(1991) Oglala Sioux Tribe (Pine Ridge), **SD** – 10 animals
(1987) Oglala Sioux Tribe (Pine Ridge), **SD** – 32 animals

(1989) Omaha Tribe of Nebraska, **NE** – 5 animals

(2003) Oneida Nation, WI – 30 animals
(1997) Oneida Nation, WI – 13 animals

(1994) Picuris Pueblo, **NM** – 5 animals

(1999) Ponca Tribe of Nebraska, NE – 19 animals
(1997) Ponca Tribe of Nebraska, NE – 5 animals)

(1997) Prairie Band Potawatomi Nation, KS – 15 animals
(1996) Prairie Band Potawatomi Nation, KS – 13 animals

(1991) Rosebud Sioux Tribe, **SD** – 10 animals
(1989) Rosebud Sioux Tribe, **SD** – 25 animals
(1987) Rosebud Sioux Tribe, **SD** – 27 animals

(1994) Round Valley (Indian Reservation), **CA** – 5 animals

(1995) Santee Sioux Tribe, **NE** – 24 animals

(2000) Shoshone-Bannock Tribes, ID – 10 animals

(2000) Sinte Gleska University, SD – 6 animals
(1999) Sinte Gleska University, SD – 14 animals

(1998) Sisseton-Wahpeton Sioux Tribe, SD – 15 animals
(1997) Sisseton-Wahpeton Sioux Tribe, SD – 18 animals
(1996) Sisseton-Wahpeton Sioux Tribe, SD – 15 animals
(1995) Sisseton-Wahpeton Sioux Tribe, SD – 12 animals
(1993) Sisseton-Wahpeton Sioux Tribe, SD – 40 animals

(1994) Southern Ute Tribe, **CO** – 5 animals
(1993) Southern Ute Tribe, **CO** – 9 animals

(2005) Spokane Tribe, WA – 46 animals
(2000) Spokane Tribe, WA – 15 animals
(1999) Spokane Tribe, WA – 12 animals

(2005) Standing Rock Sioux Tribe, ND – 16 animals
(2003) Standing Rock Sioux Tribe, ND – 9 animals
(2000) Standing Rock Sioux Tribe, ND – 19 animals

(2006) The Nature Conservancy, SD – 10 animals
(2005) The Nature Conservancy, SD – 20 animals

(1995) Tennessee Valley Authority, KY – 4 animals

(2003) Turtle Mt. Tribe of Chippewa Indians, ND – 39 animals
(2001) Turtle Mt. Tribe of Chippewa Indians, ND – 47 animals

(2005) Yakama Nation, WA – 20 animals

(1998) Yankton Sioux Tribe, SD – 8 animals
(1996) Yankton Sioux Tribe, SD – 8 animals
(1994) Yankton Sioux Tribe, **SD** – 5 animals

- There are no records of live distribution of bison to the tribes prior to 1987.
- A total of **1402 bison** were distributed live between 1987 – 2006
- Bison have gone to twenty-eight Native American Tribes (1299 or 92.7%), one Native American University (20 or 1.4 %), four State Parks (16 or 1.1%), two conservation groups (66 or 4.7%), and one female yearling to Grand Teton National Park.

Appendix F. DOI Bison Working Group Recommendations

The following recommendations were made at the Department of the Interior Interagency Bison Management Working Group Meeting, April 5-6, 2000 in Lincoln, Nebraska and include:

1. Define and maintain the current level of genetic diversity in federally managed populations.
2. Establish genetic purity of federal bison populations, i.e., no cattle genes.
3. Don't accept any bison from non-federal populations (this may not pertain to tribal populations if the population came from a federal population and no mixing with other bison has occurred).
4. Manage all federal populations for genetic diversity. When we have baseline genetic information from all federal populations based on the study, we may want to manage them across agencies.
5. The USFWS should develop proposals parallel to that of NPS to evaluate bison genetics in their (refuge) populations. Also, expand genetic studies to get as many samples as possible from all bison populations for mitochondrial DNA testing and a minimum of 20 percent of each population for nuclear DNA testing.
6. Evaluate need to either maintain or enhance genetic diversity of individual bison populations based on comparisons with other federal bison populations.

Appendix G. Necropsy Report Form

Diagnostic Sample Submission Form
NPS – Biological Resource Management Division

PARK ASSIGNED ID_____ BRMD ASSIGNED ID _____

SPECIES _____ DATE COLLECTED _____

SEX _____ EST. DATE OF DEATH _____

EST. AGE _____ SUBMISSION DATE _____

__ DIED __ EUTHANATIZED

LOCATION:

_____

_____

_____

CLINICAL HISTORY:

_____

_____

_____

_____

_____

SAMPLES SUBMITTED:

_____

_____

_____

CONTACT INFORMATION:

Park: _____

Contact Name: _____

Address: _____

Phone: _____ FAX:_____

BRMD Revised 9/27/02

Appendix H. Necropsy Shipment Procedures

INSTRUCTIONS FOR COLLECTION AND SUBMISSION OF ANIMAL CARCASSES AND TISSUES FOR POSTMORTEM EXAMINATION

NPS BIOLOGICAL RESOURCE MANAGEMENT DIVISION

Sample Collection

1. Determine if the sample is suitable for submission (carcasses with a very strong odor or with maggots are generally too old and decomposed for diagnostic testing).
2. Determine if forensic investigation is required (e.g., was the animal poached) or if additional assistance is needed.
3. Collect carcass/samples while minimizing your exposure to potential pathogens.
   a. Performing a field necropsy
      i. See attached information
      ii. Perform necropsy in a safe location
   b. Collecting carcasses
      i. Wear gloves (and coveralls if handling a large animal)
      ii. Alternatively, place a plastic bag over your hand, pick-up the carcass, and invert the plastic bag to cover the carcass
      iii. Avoid exposure to external parasites (fleas, ticks)
   c. Transporting carcasses
      i. Large carcasses – transport covered in a pick-up truck
      ii. Small carcasses – place each carcass in a plastic bag and fasten shut. Place bagged carcasses into a second plastic bag and fasten shut. Double bagging helps avoid leakage.
      iii. If immediate delivery to the diagnostic laboratory is not possible, keep the carcass/tissue cool but do not freeze unless instructed to do so. Keep the carcass away from scavengers or from areas where human exposure may occur.
      iv. Disinfect hands and equipment.

Laboratory Selection

Always call first to get permission for submission and receive any special instructions.

Several options are available for sample submission:

1. Work with a local veterinary diagnostic laboratory or laboratory with whom you have an established relationship. In this case, the park works directly with the lab and is responsible for any applicable charges. Consultation with the NPS wildlife veterinarian is available.

2. Submit samples to the NPS-BRMD for evaluation by the Colorado State University Veterinary Diagnostic Laboratory (CSUVDL) under a CESU agreement funded by BRMD. The case will be managed by the NPS veterinarian who will forward results and provide interpretation and consultation to parks as needed. See instructions for submission below.
3. Submit samples to the National Wildlife Health Center (NWHC), Madison, WI. The BRMD works closely with NWHC. Follow directions from the NWHC on submitting samples.

Submitting samples to NPS-BRMD

1. Contact Dr. Margaret Wild (970-225-3593) or admin assistant Debi Reep (970-225-3592) Most samples will be accepted, however, samples for West Nile virus surveillance should be submitted to local laboratories or the NWHC.
2. Complete BRMD Sample Submission form
3. Sample delivery options:
   a. Deliver whole carcass directly to CSUVDL
   b. Submit whole carcasses from small animals via overnight delivery to BRMD
   c. Perform field necropsy and sample collection (fresh and formalin fixed tissues). Submit samples to BRMD via overnight shipment.
4. Shipping instructions
   a. Appropriate packaging is critical, both to assure sample quality and to avoid leakage and environmental contamination. Double or triple bag all carcasses and tissues. Ship in a cooler, or Styrofoam box placed inside a cardboard box (e.g., Polyfoam Packers). Use enough blue ice to keep the carcass cool during shipment. Dry ice is preferred for tissue samples, but check with shipping company first to be sure that it is accepted.
   b. Place the BRMD Sample Submission form (and Necropsy form if necropsy was performed) in an envelope on the outside of the box. Write "Diagnostic Specimen – Wildlife" on the outside of the box.
   c. Ship Monday - Thursday via overnight delivery to:

      Dr. Margaret Wild
      NPS – Biological Resource Management Division
      1201 OakRidge Dr., Suite 200
      Fort Collins, CO 80525
      (970) 225-3593

Appendix I. Cooperative Agreement – American Prairie Foundation

Agreement No. H1560060001

Cooperative Agreement
between
The United States Department of the Interior
National Park Service, Wind Cave National Park
and
The American Prairie Foundation

This Agreement is entered into by and between The American Prairie Foundation (APF) and the United States of America, U.S. Department of the Interior, National Park Service (NPS), by and through the Superintendent, Wind Cave National Park, (WICA).

ARTICLE I – BACKGROUND AND OBJECTIVES

Considerable evidence now suggests that additional conservation and management efforts are needed to ensure the long term health of the plains bison as a species. Generally, bison herds are threatened by small herd size, unnatural culling practices, and cattle gene introgression. Among plains bison, the only public herds known for which there is a good probability of genetic purity are Henry Mountains, Yellowstone National Park (YELL), Wind Cave National Park (Halbert 2003) and Elk Island National Park (Alberta; Ward et al. 1999). Unfortunately, with the exception of YELL, all of these herds are limited to small population sizes. Previous and recent work (Gross and Wang 2005) directed specifically at federal herds indicates that: 1) Bison herds with fewer than about 400 animals are unlikely to meet a long-term goal of achieving a 90% probability of retaining 90% of genetic heterozygosity for 200 years; and 2) A moderate bison population size - about 1000 animals – is necessary to meet a long-term goal of achieving a 90% probability of retaining 90% of allelic diversity for 200 years.

Halbert (2003) indicated that in addition to being free of cattle introgression, both WICA and YELL herds also have high levels of unique genetic variation in relation to other federal populations. As such, these populations should be given conservation priority and be maintained in isolation from those populations identified in this study and by Ward (2000) as containing domestic cattle introgression.

Since both the YELL and WICA populations contain high levels of genetic variation and no evidence of domestic cattle introgression, consideration should be given to starting additional conservation herds using stock from these populations (Boyd 2003, Halbert 2003, Gross and Wang 2005). The founding and maintenance of new herds managed for conservation of the species will help to ensure the future preservation of pure bison germplasm by both expanding the total metapopulation size and building redundancy into the network of populations thereby insulating against risk.

Because of the need to conserve the plains bison and the conservation value of the WICA bison herd, APF's objectives for bison restoration in Montana are 1) to use WICA bison as a source herd for restoration, 2) to pursue the goal of establishing a pubic, conservation herd of bison that supports the long term conservation of pure bison germplasm, and 3) to engage a broad spectrum

of interested parties including state and federal land and wildlife managers, experts, non-government organizations, and private landowners in the establishment and management of the herd.

American Prairie Foundation and World Wildlife Fund (WWF), launched the American Prairie Restoration Project (APRP) in 2002 with the long-term goal of creating a large-scale prairie reserve and restoring to it the full complement of historic biodiversity. As of January, 2006 APF's holdings include 31,000 deeded and leased acres. APF plans to utilize its private and leased grazing capacity to expand the herd to a minimum size of 400 animals over the short term, and expand the population as additional land and forage become available over time.

The goal of this agreement is to facilitate the establishment of a partner herd that is genetically pure and managed for conservation on APF lands and that will contribute to the long term conservation of bison and the security of the WICA population.

This agreement will facilitate cooperative work to expand and disperse the extant known pure and relatively diverse bison genome within the Great Plains.

Long-term objectives

1. Establish a conservation herd of bison that ensures a 90% probability of retaining 90% of genetic heterozygosity for 200 years;
2. Establish a self-sustaining, naturally regulated, and ecologically effective population of bison that is free of cattle-gene introgression, semi-free ranging and subject to natural selective forces on APF deeded and leased lands in north-central Montana;
3. Establish a population that serves as a source of individuals for wild bison restoration;
4. Establish a population that enhances the long-term survival of the species genetically, behaviorally, and ecologically and that promotes prairie conservation;
5. Establish a bison population capable of sustaining a variety of consumptive and nonconsumptive uses and contributing to the cultural, aesthetic, economic, and social well-being regionally and nationally;
6. Collect and disseminate scientific information on reintroduction techniques and the ecological requirements for successful wild bison restoration;
7. Collect and disseminate scientific information on the ecology of bison; and
8. Contribute to restoring and maintaining natural ecological processes and native biological diversity.

It is the purpose of this Cooperative Agreement to assign and define responsibilities of each party regarding establishing a partner, conservation herd. The agreement includes provisions for roundup, transfer, transportation, management, and financial reimbursement.

ARTICLE II - AUTHORITY

The Act of August 25, 1916, as amended, 16 *U.S.C. § 1, 2-4 (1988),* declares that the NPS will promote and regulate the use of the various federal areas known as units of the national park system by such means and measures as conform to the fundamental purpose of the national park system, which purpose is to conserve the scenery and natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.

16 U.S.C. Sec. 1g. provides: "the National Park Service may in fiscal year 1997 and thereafter enter into cooperative agreements that involve the transfer of National Park Service appropriated funds to State, local and tribal governments, other public entities, educational institutions, and private nonprofit organizations for the public purpose of carrying out National Park Service programs, pursuant to 31 U.S.C. 6305."

To satisfy the mutual responsibilities and interests and to derive mutual benefits, WICA and APF agree to engage in a number of activities as detailed in Article III – Statement of Work.

ARTICLE III – STATEMENT OF WORK

A. APF agrees to:

1. Provide appropriate location in Montana for establishment of a conservation herd.
2. Ensure that this herd remains "genetically pure", WICA bison unless collaborative consultation with experts recommends a different management strategy at which time this agreement will be updated accordingly, see Article III, Section C, Clause 6.
3. Maintain and manage the herd at a population level that is consistent with APF goals, its goals for bison conservation, and those goals outlined within this agreement.
4. Transfer of WICA bison to APF:
    - Pay a proportionate share of the cost of the WICA roundup, including, but not limited to, helicopter operation, supplemental feeding, overtime of WICA personnel, veterinary services costs, and other supplies and materials for the roundup on a pro-rated basis proportional to the number of bison the agency receives.
    - Accept all responsibility for the animals from the point of transfer from WICA; including transportation of animals whether shipped to receiving agency, holding agency or disposition based on disease testing as determined and directed by State and Federal Veterinarians.
    - Ensure that transportation vehicles (trucks and trailers) used to transport bison meet the necessary high standards of strength and capacity for the species. Vehicles for this purpose must have metal reinforced enclosed sides, enclosed tops and have a suitable loading gate (sliding). Vehicles transporting over ten (10) animals must have partitions or gates, operable from outside the truck, or individual pens, capable of dividing the space into at least two compartments. Transport vehicles must arrive at WICA clean and not have manure or hay from previous livestock operations.
    - Provide a representative at the site during the roundup with the authority to accept and sign for transferred animals.
    - Provide resources for testing or vaccination beyond those normally completed by WICA.
5. Be responsible for the disposition of any animals injured, killed or destroyed on APF lands.
6. Not prematurely hunt, sell, barter or live transport to another entity bison transferred from WICA for the period of one year without first consulting with the Superintendent of Wind Cave National Park. Follow SEC. 10.3(d) of Title 36, Code of Federal Regulations which states that "application will not be granted when animals are to be slaughtered, or are to be released without adequate protection from premature hunting."

B. The National Park Service agrees to:

1. Provide bison for the establishment of the APF herd.
2. Ensure the WICA herd remains as "pure" Wind Cave bison.
3. Maintain and manage the WICA herd at a population minimum consistent with goals for bison genetic conservation and consistent with NPS goals and directives.
4. Transfer of WICA bison to APF:
   - Organize and conduct all operations necessary for roundup, holding, and processing of animals for reduction of the WICA herd.
   - Arrange for veterinary services necessary to insure compliance with U.S. Department of Agriculture and State regulations pertaining to shipment of animals to receiving agencies.
   - Provide handling facilities and base salary costs of National Park Service employees involved in the operation.
   - Keep all parties informed of schedules relating to the roundup and the location and time that animals can be picked up.
   - Provide the bison to be transferred. WICA will make every effort to furnish the number; age and sex of animals agreed to but is under no obligation to fulfill exact requests.
5. If necessary, transfer of APF bison to WICA:
   - Pay a proportionate share of the cost of the APF roundup, including, but not limited to, roundup operation, supplemental feeding, overtime of APF personnel, veterinary services costs, vehicle usage, and other supplies and materials for the roundup on a pro-rated basis proportional to the number of bison the agency receives relative to the total number of excess animals.
   - Accept all responsibility for the animals from the point of transfer from APF; including transportation of animals whether shipped to receiving agency, holding agency or disposition based on disease testing as determined and directed by State and Federal Veterinarians.
   - Ensure that transportation vehicles (trucks and trailers) used to transport bison meet the necessary high standards of strength and capacity for the species. Vehicles for this purpose must have metal reinforced enclosed sides, enclosed tops and have a suitable loading gate (sliding). Vehicles transporting over ten (10) animals must have partitions or gates, operable from outside the truck, or individual pens, capable of dividing the space into at least two compartments. Transport vehicles must arrive at APF clean and not have manure or hay from previous livestock operations.
   - Provide a representative at the site during the roundup with the authority to accept and sign for transferred animals.
   - Provide resources for testing or vaccination beyond those normally completed by APF.
6. Be responsible for the disposition of any animals killed or destroyed within WICA.

C. All parties mutually agree:

1. That all bison reduction operations at WICA are under the direction of WICA, and in the event of disagreement in the field, the decision by WICA will prevail.
2. That all bison reduction operations on APF lands are under the direction of APF, and in the event of disagreement in the field, the decision of the APF will prevail.

3. To produce a public communication plan for this project.
4. To develop a detailed plan for the establishment and management of APF's herd and to invite input and participation from an array of other parties including but not limited to Montana Fish, Wildlife and Parks; United States Fish and Wildlife Service; IUCN Bison Specialist Group; and the Bureau of Land Management. The plan will include:
   - Management objectives and strategies to reach the objectives;
   - The desired future conditions to be obtained;
   - Monitoring program and implementation; and
   - Research needed.
5. To seek appropriate scientific peer review of the management plan and update as needed.
6. To engage relevant experts and agency personnel in ongoing discussions of the appropriate role of APF's herd in North American bison conservation and update sourcing and management plans and this agreement accordingly.
7. To seek appropriate collaborators and funding for management specifically related to genetics, including blood sampling and DNA analysis.
8. Collaborate on data collection, analysis and writing of reports from this work so results can be communicated widely to scientific and lay community.
9. Meet on an annual basis to collaborate on bison program management.

ARTICLE IV – TERM OF AGREEMENT

This Agreement shall be effective upon the date of the last signature and shall remain in effect for a period of five years from the date of execution or until terminated in accordance with Article X below.

ARTICLE V – KEY OFFICIALS

The key officials specified in this Agreement are considered to be essential to ensure maximum coordination and communication between the parties and the work being performed. Upon written notice, either party may designate an alternate to act in the place of the designated key official, in an emergency or otherwise.

1. For the NPS:

Dan A. Foster, Chief of Resource Management
Wind Cave National Park
26611 US Highway 385
Hot Springs, South Dakota 57747
e-mail: dan_foster@nps.gov
Telephone: (605) 745-1190
Facsimile: (605) 745-4207

2. For the APF:

Sean Gerrity, President
American Prairie Foundation
104 E. Main St., Suite 202
Bozeman, MT 58715
email: sean@americanprairie.org
Telephone: (406) 587-4002
Facsimile: (406) 585-7910

ARTICLE VI – AWARD AND PAYMENT

A. **General -** The commitment of funds in furtherance of this Agreement will be authorized by individual Task Agreements issued against this Cooperative Agreement identifying each project or group of projects, amount of financial assistance and any other special term or condition applicable to that project.

B. **Payment/Invoices -** Payments to the government under this agreement will be made by electronic funds transfer (EFT). The Cooperator is required as a condition under this

agreement, to provide the government with the information required to make payment by EFT.

ARTICLE VII – PRIOR APPROVAL

Modifications to this Agreement must be in writing and require prior written approval (See Article IV - Key Officials) on items not specifically detailed in this Agreement. All Modifications to this Agreement must be approved and signed by the original signatory authorities of this Master Cooperative Agreement.

ARTICLE VIII – REPORTS AND/OR DELIVERABLES

A. Specific projects or activities for which funds are advanced will be tracked and reported by submittal of Standard Form 272, Federal Transaction Report and quarterly submittal of Standard Form 269, Financial Status Report, as outlined in 43 *CFR § 12.95*2.

B. The Secretary of the Interior and the Comptroller General of the United States, or their duly authorized representatives, will have access for the purpose of financial or programmatic review and examination to any books, documents, papers, and records that are pertinent to the Agreement at all reasonable times during the period of retention in accordance with 43 *CFR Part 1*2, *Subpart* F.

ARTICLE IX – PROPERTY UTILIZATION

OMB Circulars and 43 CFR 12, Subpart F, 12.930 - 12.948 Establishes property management standards for this Agreement.

ARTICLE X – MODIFICATION AND TERMINATION

A. This Agreement may be modified only by a written instrument executed by the parties.

B. Either party may terminate this agreement by providing the other party with 60 days advance written notice. In the event that one party provides the other party with notice of its intention to terminate, the parties shall meet promptly to discuss the reasons for the notice and to try to resolve their differences amicably. The parties commit to using every reasonable means available, including the use of a neutral mediator if necessary to avoid terminating this agreement.

ARTICLE XI – GENERAL AND SPECIAL PROVISIONS

A. General Provisions

1. OMB Circulars and other Regulations – The following *OMB Circulars* and other regulations are incorporated by reference into this agreement:

   a. *OMB Circular* A-110, as codified by 43 *CFR* Part 12, subpart F, “Uniform Administrative Requirements for Grants and Agreements with Institutions of Higher Education, Hospitals, and other Non-Profit Organizations.”

   b. *OMB Circular* A-122, "Cost Principles for Non-Profit Organizations”.

   c. *OMB Circular* A-133, "Audits of States, Local Governments, and Non-Profit Organizations".

d. 43 *CFR* Part 12, Subpart A, Administrative and Audit Requirements and Cost Principles for Assistance Programs

e. 43 *CFR* Part 12, Subpart D, "Governmentwide Debarment and Suspension (Non-procurement) and Governmentwide Requirements for Drug-Free Workplace (Grants).

f. 43 *CFR* Part 12, Subpart E, "Buy American Requirements for Assistance Programs".

g. *FAR Clause* 52.203-12, Paragraphs (a) and (b), "Limitation on Payments to Influence Certain Federal Transactions".

h. Civil Rights Assurance requirements, Title VI, Civil Rights Act of 1964 (42 U.S.C. C.2000d.1);

2. **Non-Discrimination** - All activities pursuant to this agreement shall be in compliance with the requirements of Executive Order 11246; Title VI of the Civil Rights Act of 1964 (78 Stat. 252; 42 U.S.C. §2000d et seq.); Title V, Section 504 of the Rehabilitation Act of 1973 (87 Stat. 394; 29 U.S.C. §794); the Age Discrimination Act of 1975 (89 Stat. 728; 42 U.S.C. §6101 et seq.); and with all other federal laws and regulations prohibiting discrimination on grounds of race, color, sexual orientation, national origin, disabilities, religion, age or sex.

3. **Lobbying Prohibition** - 18 *U.S.C.* § 1913, Lobbying with Appropriated Moneys - No part of the money appropriated by any enactment of Congress shall, in the absence of express authorization by Congress, be used directly or indirectly to pay for any personal service, advertisement, telegram, telephone, letter, printed or written matter, or other device, intended or designed to influence in any manner a Member of Congress, to favor or oppose, by vote or otherwise, any legislation or appropriation by Congress, whether before or after the introduction of any bill or resolution proposing such legislation or appropriation; but this shall not prevent officers or employees of the United States or of its departments or agencies from communicating to Members of Congress on the request of any Member or to Congress, through the proper official channels, requests for legislation or appropriations which they deem necessary for the efficient conduct of the public business.

4. **Anti-Deficiency Act** - 31 *U.S.C.* § 1341 - Nothing contained in this agreement shall be construed as binding the NPS to expend in any one fiscal year any sum in excess of appropriations made by Congress, for the purposes of this agreement for that fiscal year, or other obligation for the further expenditure of money in excess of such appropriations.

5. **Minority Business Enterprise Development** - Executive Order 12432 - It is national policy to award a fair share of contracts to small and minority firms. The NPS is strongly committed to the objectives of this policy and encourages all recipients of its cooperative agreements to take affirmative steps to ensure such fairness by ensuring procurement procedures are carried out in accordance with 43 *CFR* **§** 12.944 for Institutions of Higher Education; Hospitals and other Non-Profit Organizations, and 43 *CFR* **§** 12.76 for State and Local Governments.

B. Special Provision

1. Public Information

   a. The APF will not publicize, or otherwise circulate, promotional material (such as advertisements, sales brochures, press releases, speeches, pictures, movies, articles, manuscripts or other publications) which states or implies Governmental, Departmental, bureau, or Government employee endorsement of a product, service, or position which the APF represents. No release of information relating to this Agreement may state or imply that the Government approves of the work product of the APF or considers the APF work product to be superior to other products or services.

   b. The APF will ensure that all information submitted for publication or other public releases of information regarding this project will carry the following disclaimer:

      The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the opinions or policies of the U.S. Government. Mention of trade names or commercial products does not constitute their endorsement by the U.S. Government.

   c. The APF will obtain prior NPS approval from WICA before releasing for any public information which refer to the Department of the Interior, any bureau or employee (by name or title), or to this Agreement. The specific text, layout, photographs, etc., of the proposed release must be submitted to WICA along with the request for approval.

   d. The APF further agrees to include the above provisions in any sub-award to any sub-recipient, except for a sub-award to a state government, a local government, or to a federally recognized Indian tribal government.

2. Publications of results of studies

   No party will unilaterally publish a joint publication without consulting the other party. This restriction does not apply to popular publication of previously published technical matter. Publications pursuant to this Agreement may be produced independently or in collaboration with others, however, in all cases proper credit will be given to the efforts of those parties' contribution to the publication. In the event no agreement is reached concerning the manner of publication or interpretation of results, either party may publish data after due notice and submission of the proposed manuscripts to the other. In such instances, the party publishing the data will give due credit to the cooperation but assume full responsibility for any statements on which there is a difference of opinion.

C. Certifications – The following form(s) are incorporated into this Agreement by reference. These certifications are required in accordance with the provisions of this Agreement:

1. DI-2010, U.S. Department of the Interior Certification Regarding Debarment, Suspension and Other Responsibility Matters, Drug-Free Workplace Requirement and Lobbying.

2. Vendor Payment Enrollment must be accomplished by registering at the Central Contractor Registration (CCR) site at WWW.CCR.GOV, which enables the National Park Service to process payments via electronic funds transfer, in lieu of a check, directly to your financial institution.

3. Taxpayer Identifying Number. In accordance with the Debt Collection Improvement Act of 1996 all Modifications to this agreement which obligate NPS Funds for expenditure, shall have on the first page of that Modification, the Taxpayer Identification Number for the APF.
4. Standard Form 424, Application for Financial Assistance and Standard Form 424A, Budget Information.

ARTICLE XII – ATTACHMENTS

A. DI-2010, Certifications Regarding Debarment, Suspension and Other Responsibility Matters, Drug-Free Workplace Requirements and Lobbying.

B. Vendor Payment Enrollment Form by registration at WWW.CCR.GOV.

C. SF 424A, Budget Information – Non-construction programs.

D. SF 270, Request for Advance or Reimbursement.

ARTICLE XIII – LIABILITY

The American Prairie Foundation agrees:

A. To indemnify, save and hold harmless, and defend the United States against all fines, claims, damages, losses judgments, and expenses arising out of, or from, any act or omission of the American Prairie Foundation, its officers, employees, or (members, participants, agents, representatives, agents as appropriate) arising out of or in any way connected to activities authorized pursuant to this Agreement. This obligation shall survive the termination of this Agreement.

B. American Prairie Foundation shall procure and maintain during the term of this Agreement and any extension thereof liability insurance in form satisfactory to the Contracting Officer by an insurance company acceptable to the Contracting Officer. The named insured party under the policy shall be the American Prairie Foundation. The amounts of the insurance shall be not less than follows:

   $ 50,000.....each person
   $100,000.....each occurrence
   $50,000.....property damage

   Each policy shall have a certificate evidencing the insurance coverage. The insurance company shall provide an endorsement to the Contracting Officer 30 days prior to the effective date of cancellation or termination of the policy or certificate; or modification of the policy or certificate which may adversely affect the interest of the Government in such insurance. The certificate shall identify the agreement number, the name and address of the Contracting Officer, as well as the insured, the policy number and a brief description of the agreement services to be performed. The cooperator shall furnish the Contracting Officer with a copy of an acceptable insurance certificate prior to beginning the work.

C. To provide workers' compensation protection to the officers, employees and representatives.

D. To pay the United States the full value for all damage to the lands or other property of the United States caused by the cooperator, its officers, employees, or representatives.

E. In the event of damage to or destruction of buildings and facilities assigned for the use of the cooperator, in whole or in part by any cause whatsoever, nothing contained herein shall be deemed to require the NPS to replace or repair the buildings or facilities. If the NPS determines in writing, after consultation with the cooperator, that damage to the buildings or portions thereof renders such buildings unsuitable for continued use by the cooperator, the NPS shall assume sole control over such buildings or portions thereof. If the buildings or facilities rendered unsuitable for use are essential for conducting operations authorized under this Agreement, then failure to substitute and assign other facilities acceptable to the cooperator will constitute termination of this Agreement by the NPS.

F. To cooperate with the NPS in the investigation and defense of any claims that may be filed with the NPS arising out of the activities of the cooperator, its agents, and employees.

ARTICLE XIV – SIGNATURES

IN WITNESS HERETO, the parties hereto have executed this Agreement on the date(s) set forth below.

American Prairie Foundation
104 E. Main St., Suite 202
Bozeman, Montana

/S/ Sean Gerrity 6/27/06
Sean Gerrity Date

National Park Service
Wind Cave National Park
Hot Springs, South Dakota

/S/ Linda L. Stoll 7/31/06
Superintendent Date

National Park Service
Keystone, South Dakota

/S/ Ronald Eilefson 8/3/06
Contracting Officer Date

Appendix J. MOA with Custer State Park on Accidental Bison

Agreement Number G1506040018

MEMORANDUM OF UNDERSTANDING
BETWEEN
THE UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
AND THE
STATE OF SOUTH DAKOTA,
CUSTER STATE PARK

This Agreement is entered into by and between the National Park Service, United States Department of the Interior, acting through the Superintendent of Wind Cave National Park (hereinafter "WICA"), and the State of South Dakota, acting through the Superintendent of Custer State Park (hereinafter "CSP").

ARTICLE I – BACKGROUND AND OBJECTIVES

The objective of this Agreement is to establish standard operating procedures for handling accidental bison exchanges between Wind Cave National Park and Custer State Park.

This Agreement also reaffirms commitments to maintain the fence that serves as the common boundary.

ARTICLE II – AUTHORITY

A. Federal:

The Act of August 25, 1916, as amended, 16 *U.S.C. § 1, 2-4 (1988),* declares that the NPS will promote and regulate the use of the various federal areas known as units of the national park system by such means and measures as conform to the fundamental purpose of the national park system, which purpose is to conserve the scenery and natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.

The Act of January 9, 1903, 16 *U.S.C. § 141-146,* established Wind Cave National Park (32 Stat. 765-766), to protect Wind Cave.

The act of August 10, 1912, provided for the establishment of Wind Cave National Game Preserve on the land included within the boundaries of Wind Cave National Park under the jurisdiction of what was then the Bureau of Biological Survey of the U.S. Department of Agriculture. This action established "a permanent national range for a herd of buffalo to be presented to the U.S. by the American Bison Society, and for such other native American game animals as may be placed therein."

The act of June 15, 1935 abolished the Wind Cave National Game Preserve and transferred all property therein to Wind Cave National Park, which would be subject to all applicable

laws and regulations for the purposes expressed in the act of August 10, 1912, establishing the game preserve.

B. State:

South Dakota Codified Law (SDCL) 41.17.1.1

To satisfy the mutual responsibilities and interests and to derive mutual benefits, WICA and CSP agree to engage in the activities as detailed below:

ARTICLE III – <u>STATEMENT OF WORK</u>

A. The NPS agrees to:

1. General Rut Season (July 1- Sept 1).
    a. Contact CSP of intent to dispatch branded bison in case CSP has time to salvage the meat, hide, head, etc.
    b. Dispatch CSP branded bison that appear within WICA.
2. Outside General Rut Season (Sept 2- June 30)
    a. Notify CSP of branded bison within WICA and accommodate CSP with time to attempt a planned retrieval. CSP may use horses in the retrieval attempt. CSP riders may use noisemaker (i.e., whips, whistles, etc.) for safety concerns while attempting to herd a branded animal back to CSP.
    b. Accommodate CSP, to the extent possible, in allowing for retrieval, but activity and behavior (i.e., "tending", sniffing, licking, lip curling, fighting, proximity to other animals etc.) taking place at the time must be considered. WICA has bison that participate in breeding at various times of the year and reserves the right to dispatch an animal immediately, without consultation.
    c. In the event of a failed retrieval, WICA may dispatch the animal. A failed retrieval would be determined on a case by case basis.
3. Collect and relay to CSP within 2 days the following data from animals dispatched: sex, brand numbers, PIT tag if available, and condition description. CSP will be responsible for collection of additional data or materials of interest, such as heads and hide on bison dispatched within WICA.

B. CSP agrees to:

1. Note all PIT tags discovered during CSP handling events that are not registered on CSP data bases and forward tag numbers, age, sex, and condition comments to WICA immediately following the handling event.
2. Retain and manage as their own accidental WICA bison found within CSP.

C. Both WICA and CSP agree to:

1. Fund their individual participation in this process.
2. Meet regularly to inform and coordinate, to the best of their ability, bison management efforts.

3. Inspect/repair their respective portions of the boundary fence between the two parks within one week of an exchange event.
4. Should an exchange occur that involves a significant number of bison, consultation shall occur between both parks regarding retrieval and/or herd separation.
5. Assume responsibility for testing of accidental animals and share test results with the other park.

ARTICLE IV – TERM OF AGREEMENT

This Agreement will be effective for a period of five years from the date of final signature, unless it is terminated earlier by one of the parties pursuant to Article VII that follows.

ARTICLE V – KEY OFFICIALS

A. Key officials are essential to ensure maximum coordination and communications between the parties and the work being performed.

1. **For WICA:**

Dan A. Foster, Chief – Res. Mgt.
Wind Cave National Park
RR1, Box 190
Hot Springs, South Dakota 57747
e-mail: dan_foster@nps.gov
Telephone: (605) 745-4600
Facsimile: (605) 745-4207

2. **For CSP:**

Ronald E. Walker, Division Staff Spec.
Custer State Park
HC 83, Box 70
Custer, South Dakota 57730
e-mail: ron.walker@state.sd.us
Telephone: (605) 255-4515
Facsimile: (605) 255-4460

ARTICLE VI – PROPERTY UTILIZATION

OMB Circulars and 43 CFR 12, Subpart F, 12.930 - 12.948 Establishes property management standards for this Agreement.

ARTICLE VII – MODIFICATION AND TERMINATION

A. This Agreement may be modified only by a written instrument executed by the parties.

B. Either party may terminate this Agreement by providing the other party with thirty (30) days advance written notice. In the event that one party provides the other party with notice of its intention to terminate, the parties will meet promptly to discuss the reasons for the notice and to try to resolve their differences.

ARTICLE VIII – STANDARD CLAUSES

A. Special Provisions

Publications of Results of Studies

No party will unilaterally publish a joint publication regarding trespass bison activities without consulting the other party. This restriction does not apply to popular publication of previously published technical matter. Publications pursuant to this Agreement may be produced independently or in collaboration with others; however, in all cases proper credit will be given to the efforts of those parties contributing to the publication. In the event no agreement is reached concerning the manner of publication or interpretation of results, either party may publish data after due notice and submission of the proposed manuscripts to the other. In such instances, the

party publishing the data will give due credit to the cooperation but assume full responsibility for any statements on which there is a difference of opinion.

Public Information Release

No party will unilaterally publish a public information release regarding trespass bison activities without consulting the other party. The specific text, layout, photographs, etc. of the proposed release must be submitted with the request for approval.

ARTICLE IX – SIGNATURES

IN WITNESS HEREOF, the parties hereto have executed this Agreement on the date(s) set forth below.

FOR THE NATIONAL PARK SERVICE, WIND CAVE NATIONAL PARK:

Signature: /S/ Linda L. Stoll

Name: Linda L. Stoll

Title: Superintendent

Date: 11/02/2004

FOR THE STATE OF SOUTH DAKOTA, CUSTER STATE PARK:

Signature: /S/ Ronald E. Walker

Name: Ronald E. Walker

Title: Division Staff Specialist

Date: 11/04/2004

Appendix K. Environmental Screening Form

WIND CAVE NATIONAL PARK

A. PROJECT INFORMATION

Park Name: Wind Cave National Park

Project Number: _____ PMIS #: _____

Project Type (*Check*): ☐ Cyclic ☐ Cultural Cyclic ☐ Repair/Rehab ☒ ONPS
☐ NRPP ☐ CRPP ☐ FLHP ☐ Line Item
☐ Fee Demo ☐ Concession Reimbursable ☐ Other (specify) : _____

Project Location: Parkwide

Project Originator/Coordinator: Dan Roddy

Project Title: WIND CAVE NATIONAL PARK BISON MANAGEMENT PLAN

Contract #: _____

Contractor Name: _____

Administrative Record Location: Wind Cave N.P. Central Files

Administrative Record Contact: Sandy Meyer

B. PROJECT DESCRIPTION/LOCATION

Please see attached Bison Management Plan

Preliminary drawings attached? ☐ Yes ☒ No

Background info attached? ☐ Yes ☒ No

Date form initiated: June 15, 2004

Anticipated compliance completion date: December 2006

Projected advertisement/Day labor start: _____

Construction start: _____

C. RESOURCE EFFECTS TO CONSIDER

Are any measurable[1] impacts possible on the following physical, natural or cultural resources?	Yes	No	Data Needed to Determine
1. Geological resources – soils, bedrock, streambeds, etc.		X	Wallows, streambeds, mineral licks
2. From geohazards		X	
3. Air quality		X	
4. Soundscapes		X	Rut and vocalizations
5. Water quality or quantity		X	
6. Streamflow characteristics		X	Vegetation use, trailing, grazing
7. Floodplains or wetlands		X	Trampling and wallows
8. Land use, including occupancy, income, values, ownership, type of use		X	Value of adjacent property on an economic basis
9. Plant species or habitats of special concern: state-listed, proposed for state or federal listing		X	
10. Species of special concern (plant or animal; state or federal listed or proposed for listing) or their habitat		X	Prairie dogs
11. Unique ecosystems, biosphere reserves, World Heritage Sites		X	
12. Unique or important wildlife or wildlife habitat		X	Mixed grass prairie and their relationship/impact to other species and bison
13. Unique or important fish or fish habitat		X	Mountain sucker (State species of concern)
14. Introduce or promote non-native species (plant or animal)		X	Thistle
15. Recreation resources, including supply, demand, visitation, activities, etc.		X	Visitation
16. Visitor experience, aesthetic resources, including impacts to interpretive operations and interpretive facilities		X	Visitor, aesthetic, interpretation
17. Cultural resources including cultural landscapes, ethnographic resources		X	Historic and ethnographic resources
18. Socioeconomics, including employment, occupation, income changes, tax base, infrastructure		X	Tourism and bison recipients
19. Minority and low income populations, ethnography, size, migration patterns, etc.		X	Bison are an ethnographic resource of value to tribes
20. Energy resources		X	
21. Other agency or tribal land use plans or policies			CSP
22. Resource, including energy, conservation potential		X	
23. Urban quality, gateway communities, etc.			Tourism
24. Long-term management of resources or land/resource productivity		X	Range management and habitat utilization
25. Other important environment resources (e.g. geothermal, paleontological resources)?		X	Possible wallows and walking

[1] MEASURABLE IMPACTS ARE THOSE THAT THE INTERDISCIPLINARY TEAM DETERMINES TO BE GREATER THAN NEGLIGIBLE BY THE ANALYSIS PROCESS DESCRIBED IN DO-12 §2.9 AND §4.5(G)(4) TO (G)(5).

D. Mandatory Criteria

Mandatory Criteria: If implemented, would the proposal:	Yes	No	Data Needed to Determine
A. Have material adverse effects on public health or safety?		X	
B. Have adverse effects on such unique characteristics as historic or cultural resources; park, recreation, or refuge lands; wilderness areas; wild or scenic rivers; national natural landmarks; sole or principal drinking water aquifers; prime farmlands; wetlands; floodplains; or ecologically significant or critical areas, including those listed on the National Register of Natural Landmarks?		X	
C. Have highly controversial environmental effects?		X	Slaughter
D. Have highly uncertain and potentially significant environmental effects or involve unique or unknown environmental risks?		X	
E. Establish a precedent for future action or represent a decision in principle about future actions with potentially significant environmental effects?		X	Positive environmental effect
F. Be directly related to other actions with individually insignificant, but cumulatively significant, environmental effects?		X	Works with other management plans for positive environmental effects
G. Have adverse effects on properties listed or eligible for listing on the National Register of Historic Places?		X	
H. Have adverse effects on species listed or proposed to be listed on the List of Endangered or Threatened Species or have adverse effects on designated Critical Habitat for these species?		X	
I. Require compliance with Executive Order 11988 (Floodplain Management), Executive Order 11990 (Protection of Wetlands), or the Fish and Wildlife Coordination Act?		X	
J. Threaten to violate a federal, state, local, or tribal law or requirement imposed for the protection of the environment?		X	
K. Involve unresolved conflicts concerning alternative uses of available resources (NEPA sec. 102(2)(E)?		X	
L. Have a disproportionate, significant adverse effect on low-income or minority populations (EO 12898)?		X	
M. Restrict access to and ceremonial use of Indian sacred sites by Indian religious practitioners or adversely affect the physical integrity of such sacred sites (EO 130007)?		X	Lack of action may be impact
N. Contribute to the introduction, continued existence, or spread of federally listed noxious weeds (Federal Noxious Weed Control Act)?		X	
O. Contribute to the introduction, continued existence, or spread of non-native invasive species or actions that may promote the introduction, growth or expansion of the range of non-native invasive species (EO 13112)?		X	
P. Require a permit from a federal, state, or local agency to proceed, unless the agency from which the permit is required agrees that a CE is appropriate?		X	
Q. Have the potential for significant impact as indicated by a federal, state, or local agency or Indian tribe?		X	
R. Have the potential to be controversial because of disagreement over possible environmental effects?		X	
S. Have the potential to violate the NPS Organic Act by impairing park resources or values?		X	

E. OTHER INFORMATION

Are personnel preparing this form familiar with the site? ☒ Yes ☐ No

Did personnel conduct a site visit? ☐ Yes ☒ No

(If yes, attach meeting notes or additional pages noting when site visit took place, who attended, etc.)

Is the project in an approved plan such as a General Management Plan or an Implementation Plan with an accompanying environmental document? ☐ Yes ☒ No

If so, plan name _____

Is the project still consistent with the approved plan? ☐ Yes ☐ No *(If no, prepare plan/EA or EIS.)*

Is the environmental document accurate and up-to-date? ☐ Yes ☐ No *(If no, prepare plan/EA or EIS.)*

FONSI☐ ROD ☐ Date approved _____

Are there any interested or affected agencies or parties? ☒ Yes ☐ No

Did you make a diligent effort to contact them? ☐ Yes ☒No

Has consultation with all affected agencies or tribes been completed? ☒ Yes ☐ No

Are there any connected, cumulative, or similar actions as part of the proposed action? ☐ Yes ☒ No
(If so, attach additional pages detailing the other actions.)

F. LEGAL REVIEW

National Environmental Policy Act

Data entered by: _____
(*Choose one and fill in blanks*)

☐ undocumented CE; CE Citation: Sec 3.3_____

☒ documented CE; CE Citation: Sec 3.4 B. (1) Changes or amendments to an approved plan, when such changes have no potential for environmental impact.

Excepted actions apply? ☐ Yes ☐ No (*If yes, do EA or EIS*)
(Attach signed CE form)

☐ EA — EA release to public _____
FONSI date _____

☐ EIS — ROD date _____

National Historic Preservation Act

Data entered by: _____

Ground disturbance involved? ☐ Yes ☒ No
Historic structures involved? ☐ Yes ☒ No
Cultural landscapes involved? ☐ Yes ☒ No
Ethnographic concerns involved? ☒ Yes ☐ No
If yes, interested parties contacted? ☒ Yes ☐ No

(*Choose one and fill in blanks*)

☒ No historic properties affected

☐ Programmatic exclusion Citation _____Date AEF to SHPO/THPO _____

Determination of effect ☐ No effect ☐ No adverse effect ☐ Adverse Effect

Date to SHPO/THPO _____ Date to ACHP _____

Date consultation completed _____

Endangered Species Act

Data entered by: Dan Foster

Any threatened/endangered species in area? ☐ Yes ☒ No

If species in area ☐ No effect ☐ Not Likely to Adversely Affect ☐ Likely to Adversely Affect

Date Section 7 to FWS _____ Date FWS response _____

Floodplains/Wetlands/§404 Permits

Data entered by: Dan Foster

Is project in 100- or 500-year floodplain?	☐ Yes	☒ No; (If yes, *attach SOF)*
Is project in wetlands?	☐ Yes	☒ No; (If yes, attach SOF)
404 permit needed?	☐ Yes	☒ No; Date _____
State 401 certification?	☐ Yes	☒ No; Date _____
State DENR permit?	☐ Yes	☒ No; Date _____

G. MITIGATING MEASURES TO BE INCLUDED IN PROJECT:

(Specify here or attach appropriate pages from EA, EIS, FONSI, or ROD)

H. INSTRUCTIONS FOR DETERMINING APPROPRIATE NEPA PATHWAY

Complete the following tasks: conduct a site visit or ensure that staff is familiar with the site's specifics; consult with affected agencies, and/or tribes; and interested public and complete this environmental screening form.

If your action is not described in DO-12 § 3.4 or if you checked yes or identified "data needed to determine" impacts in any block in Section D (Mandatory Criteria), you must prepare an environmental assessment or environmental impact statement.

If you checked no in all blocks in Section C (resource effects to consider) and checked no in all blocks in Section D (Mandatory Criteria) and if the action is described in DO-12 § 3.4, you may proceed to the categorical exclusion form. (Appendix 2 of DO-12 Handbook)

I. INTERDISIPLINARY TEAM SIGNATORY (All interdisciplinary team members must sign.)

By signing this form, you affirm the following: you have either completed a site visit or are familiar with the specifics of the site; you have consulted with affected agencies and tribes; and you, to the best of your knowledge, have answered the questions posed in the checklist correctly

Req'd	Technical field or expertise	Signature	Date
☐	Chief of Resource Management Dan Foster		
☐	Cultural Resource Coordinator Tom Farrell		
☐	Biologist Dan Roddy		
☐	Chief Park Ranger Rick Mossman		
☐	Chief of Maintenance Steve Schrempp		
☐			

WIND CAVE NATIONAL PARK
Categorical Exclusion Form

Project Name: WIND CAVE NATIONAL PARK BISON MANAGEMENT PLAN **Date:** March 26, 2007

Describe project, including location (reference the attached Environmental Screening Form (ESF), if appropriate):

Adoption of the revised Bison Management Plan

Describe the category used to exclude action from further NEPA analysis and indicate the number of the category (see section 3–4 of DO-12):

CE Citation: Sec 3.4 B. (1) Changes or amendments to an approved plan, when such changes have no potential for environmental impact.

Describe any public or agency involvement effort conducted (reference the attached ESF):
Please see attached Environmental Screeneing Form.

On the basis of the environmental impact information in the statutory compliance file, with which I am familiar, I am categorically excluding the described project from further NEPA analysis. No exceptional circumstances (i.e., all boxes in the ESF are marked "no") or conditions in section 3-6 apply, and the action is fully described in section 3-4 of DO-12.

_____ _____

Superintendent or Designee **Date**

_____

Chief of Resource Management, NPS Contact Person
Wind Cave National Park
RR 1, Box 190 Hot Springs, SD 57747
605-745-1190